

THE AUTOMOBILE

The Record of a Transcontinental Trek-II



THE CHICAGO MOTORCYCLE POLICE CAME OUT TO THE INDIANA LINE AND ESCORTED THE TOURISTS AND THEIR HOSTS INTO THE WINDY CITY



ACTUAL experience in any line is the best basis upon which to erect valuable conclusions. Actual experience in transcontinental touring affords the only foundation having real merit for those who contemplate making such tours. The actual experience undergone by the party of forty persons in twelve Premier cars, which went from the Atlantic to the Pacific last summer, affords a mass of authentic road data that cannot be overlooked at this stage of road development by those who figure of duplicating the course.

The following account covers the route of the caravan from Atlantic City, N. J., to Los Angeles, Cal. Little space is devoted to describing well-known Eastern highways, but much more is utilized to tell of the wild and woolly West. All told, fourteen states were traversed besides the District of Columbia. The story of the tour follows:

New Jersey—The twelve cars constituting the touring column lined up in the ocean at Atlantic City on the morning of June 26 with the water almost reaching the differential casings. Taking their last view of the mighty Atlantic, the travelers sped through the City by the Sea. The course was past the meadows

The Second Installment of an Account of the Ocean-to-Ocean Tour of a Dozen Automobiles

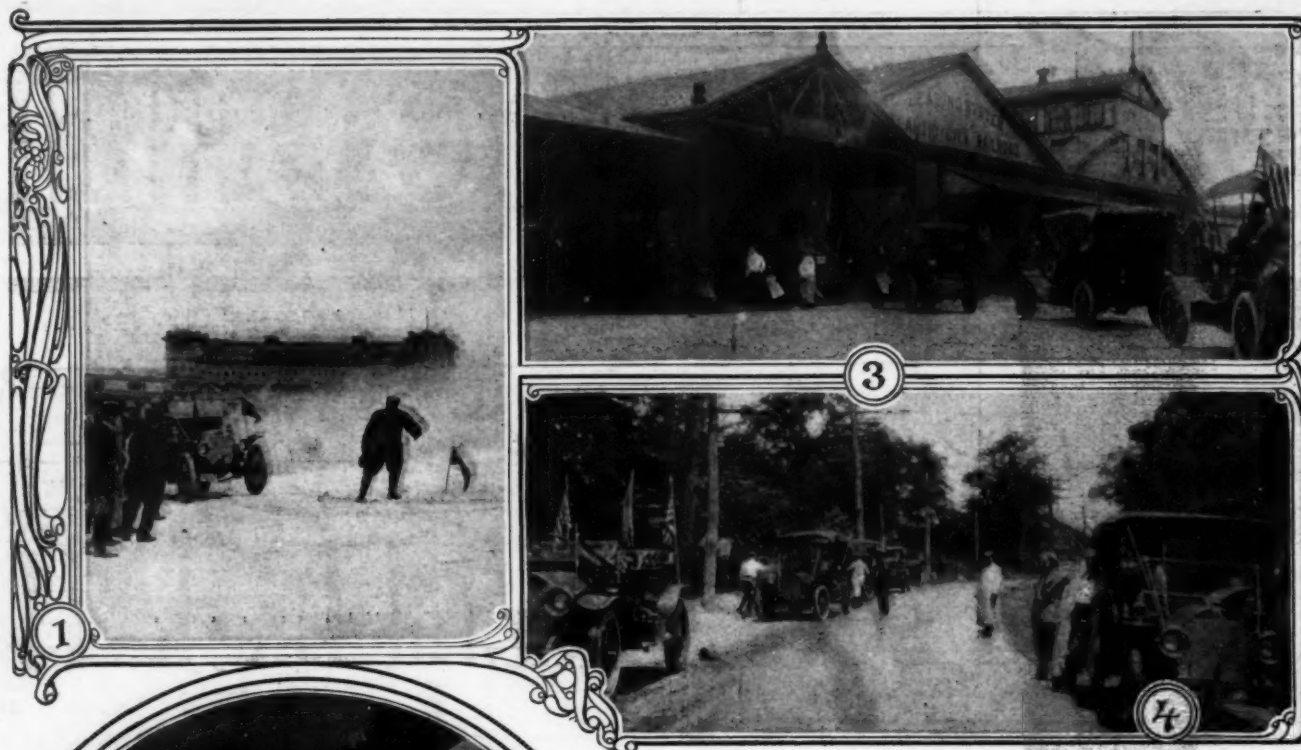
By JOHN GUY MONIHAN

could pass in safety with room to spare. From Malaga to Clayton, Glassboro, Gloucester and Camden over the state highway is an ideal road all the way. From Camden they crossed the Delaware River to Philadelphia.

Pennsylvania—At the Market Street Ferry, with police and automobile escort, they proceeded north on Market street around the City Hall, north in Broad street to Fairmount Park and city line; thence over the Lancaster Pike, with its many toll-gates, with a slight detour through the famous camping places of the Continental Army at Valley Forge; thence to Lancaster and Harrisburg, over the rolling hills of eastern Pennsylvania with a few bad stretches. They here experienced the first of the thank-you-ma'ams, or water breakers, for which Pennsylvania alone is famous.

From Harrisburg they detoured back to Mt. Joy and Marietta, crossing the Susquehanna River at Columbia. The road conditions from Harrisburg to Columbia and from there to York and Hanover were fairly good, but not what they should have been considering the \$15 paid for tolls on this day.

and over the thoroughfares to Pleasantville, and from there to Mays Landing, crossing Egg Harbor River. For 25 miles the most wonderful going was found on the Malaga Pike, a boulevard of gravel construction, without ruts, which was like running on velvet. At top speed two cars



- 1—Rounding the stake in the official start from Atlantic City
- 2—At Uniontown, Pa., the tourists were lunched at the club
- 3—The Philadelphia contingent starting for Atlantic City
- 4—The road between Baltimore and Washington was excellent

the famous British general, Braddock, whose body was brought to this spot in Pennsylvania and buried.

From Cumberland to Uniontown the way led through the heart of the Alleghenys, crossing Laurel and Chesnut Ridge. Between the rough roads, the notorious Pennsylvania water breakers and the steep grades the tourists had some of the worst going of the entire trip. A coast of 20 miles brought them to the Monongahela River, which is crossed by cable ferry at the cost of 25 cents a car.

Work on Roads Makes Bad Going

MARYLAND—On the run from Hanover to Westminster and into Baltimore the road conditions were ideal. From Baltimore to Washington the entire road is macadam and asphalt except 5 or 6 miles just outside the District of Columbia, which was very bad. From Washington to Rockville and Frederick, the roads were poor, consisting of red loam which, when wet, is slippery. These roads were especially bad at the time this trip was made because of a large amount of work which was being done upon them. Within a year they will probably be ideal.

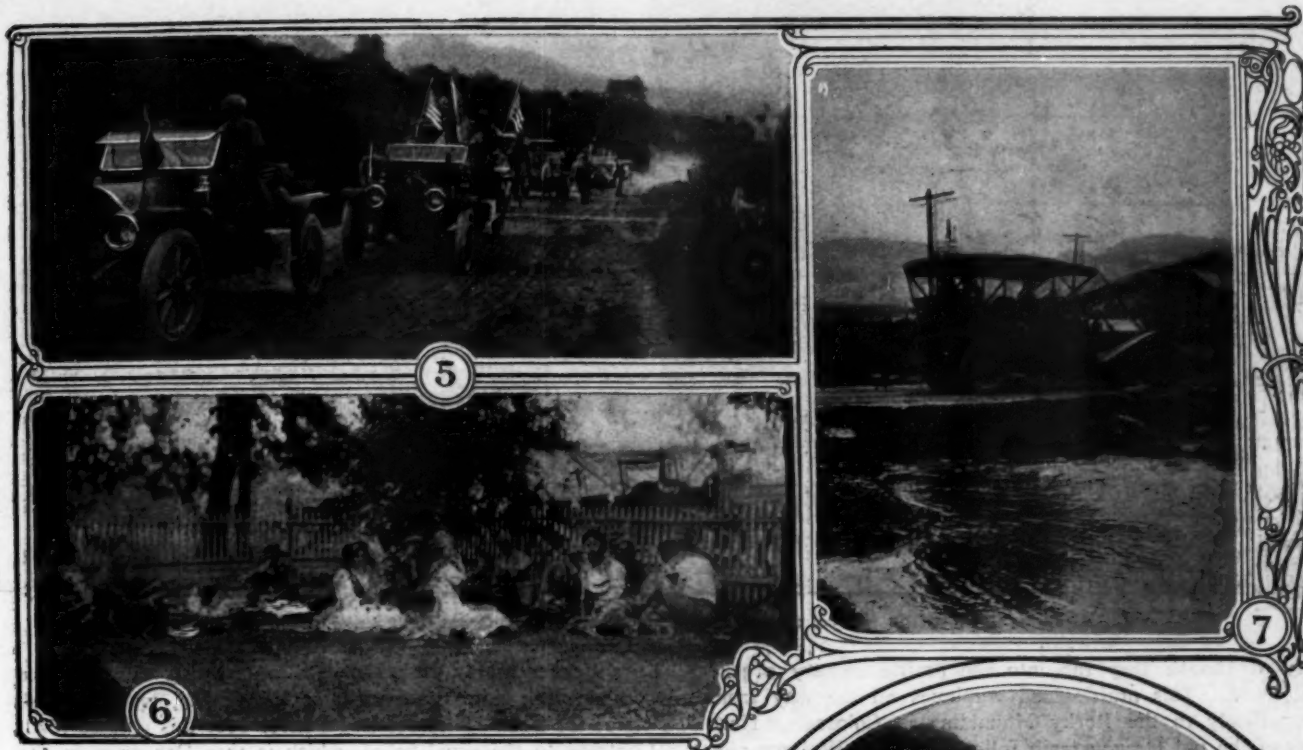
Between Frederick and Hagerstown the Blue Ridge Mountains were crossed. The roads were excellent and the scenery magnificent. All this country was made famous by the battles fought there in the Civil War. Many tablets along the roadsides mark the battle-fields.

West Virginia—The run in West Virginia was of only a few miles on the road from Washington, Pa., to Wheeling, where we crossed the Ohio River, entering Ohio at Bridgeport.

Ohio—From Bridgeport to Zanesville the roads consisted of rolling hills, good surface, but with water breakers. The arrival at Zanesville was a matter of much joy to the Premier tourists because it marked the end of the water breakers which had punished the cars and their drivers and occupants all the way from Philadelphia.

Straight across Ohio to Columbus and Richmond, Ind., ideal road conditions were found; good gravel roads and a few hills.

They again entered the state of Pennsylvania after a run through Maryland to Baltimore at Greencastle, crossing the famous division line between the North and South at a little town called Mason and Dixon. Then followed the 1907 Glidden trail through Mercersburg, over the steep winding climb of the Cove Mountains and a coast of 3 1-2 miles down the Scrub Ridge Sideling Hill, then to Rays Hill, the steepest climb of the entire transcontinental tour with the exception of the ascent to the summit of the Sierra Nevada Mountains. The ascent of this ridge of the Allegheny Mountains was 4 1-2 miles, all on second speed. They coasted from the summit to Everitt, there following the winding drive along the beautiful Juniata to Bedford Springs. The water breakers made this otherwise desirable run entirely disagreeable. From Bedford they ran to Cumberland, Md., picking up the National Highway, which runs for a few miles through this state back into Pennsylvania, and from there to Uniontown. All of this country is famous as the stage setting of the Confederate raids against Washington. Many tablets are located on the roadside commemorating these skirmishes. Just outside of Uniontown is found the grave of



5—Ray's Hill, a 4-mile climb out of McConnellsburg, Pa.

6—Lunching on crackers and beans at an Iowa general store

7—Entering foothills of the Rockies, at Fort Collins, Col.

8—Canyon on the road approaching Forks Hotel, Col.

Indiana—From Richmond the road runs straight West, practically without twists or turns, into Indianapolis. At Indianapolis the cars left the National Highway and the Ocean-to-Ocean trail led north to Lafayette, crossing the Wabash River at Rensselaer, then crossing the Kankakee swamps into Hammond.

The road from Indianapolis to Rensselaer is excellent. For 45 miles north of this city heavy sand was encountered, while through the swamps the roads are fair. Shortly after leaving Orchard Grove, a few miles north of the Kankakee swamps, the tourists traveled over a part of the course on which the first competition for the Cobe trophy was held.

From there the roads were macadam all the way into Chicago. The pleasure of this run was marred by exceedingly bad streets in South Chicago. The usual difficulty of entering Chicago proper was obviated by the police escorts.

From Chicago to the Mississippi

ILLINOIS—The best road across this state is given as follows: From Chicago to Geneva, crossing the Fox River at this point; then to DeKalb, Rochelle and Dixon, where it crosses the Rock River, one of the most picturesque rivers of the trip, to Sterling. All of this road is good gravel. From Sterling to Davenport there are sandy roads, which are good when dry. This road is most interesting because of the fact that it follows the course of the Rock River to Moline and Rock Island, where it crosses the Mississippi into Davenport. The tourist will find the streets through these towns somewhat confusing.

Iowa—From the automobile standpoint Iowa is mostly famous for its River-to-River road which was built by the united efforts of the farmers living along the same in less than 3 hours. They started on this road at Davenport running to Iowa City, the university town, crossing the Iowa River just west of the college grounds.

At South Amana the ideal of gumbo roads, fast, elastic and



smooth riding, because of the downpour of rain changed into one of the worst roads of the trip, slippery beyond imagination, and the cars held to the road and stayed out of the ditches only with the greatest difficulty. From a road upon which one could run as fast as desired in comfort, it became impossible to go faster than 12 miles an hour. There was about 40 miles of this gumbo. At Newton no rain had fallen, nor on the road to Colfax, which was made the night control. Des Moines River, one of the biggest Western streams, was crossed at the city of Des Moines.

The Western trail brought the tour next to Guthrie Center, Atlantic and Avoca. For the next 12 miles the cars traveled over what is famed as the washboard road, because of its series of low hills ranging from one-quarter to a half mile in length, but with grades which run as high as 20 degrees.

The next city is Council Bluffs, after which they passed over the bottom lands of the Missouri River with its toll gate, which cost 15 cents, into the city of Omaha.

Nebraska—After running 10 miles over macadam through



Monument Point, on the route around the northern end of Great Salt Lake, Utah

the city of Omaha they ran into the prairie country of the Central West. This prairie land continues all the way from here practically to the Rocky Mountains in Colorado. Here also began the old Oregon trail, followed by the Western pioneers; here, also, were found the real prairie schooners, which have changed but little in appearance in the last 50 years. The locomotion is now, however, almost exclusively by horse, while in the days gone by oxen were used. The prairie schooner of the tour with its conastoga top, which resembled the better-known vehicle of the plains, created much interest from here to the Pacific Coast. The marvel of its motor and electric lights seemed to be almost beyond the imagination of the natives.

At Fremont, the first big town west of Omaha, the Platte Valley begins. This river bed was followed across Nebraska, passing out at Julesburg, Col. To the tourists this section was principally remarkable because of the fact that it was dry.

From Fremont, the route went through Columbus, Grand Island and Kearney, all of them up-to-date hustling cities with wide streets and beautiful public buildings and school houses.

In these smaller towns quite the most important building was the garage, almost invariably of brick and steel construction.

Five miles west of Kearney they passed the geographical center of the United States. As the crow flies, it was 1,733 miles east to Boston and West to San Francisco.

At North Platte, where the North and South Platte Rivers join, the trail following the South Platte River in a Southwesterly direction into Colorado, which state was entered a few miles South of the town of Julesburg.

Through the Sugar Beet Country

COLORADO—Still in a southwesterly direction through the great sugar-beet country, dotted here and there with sugar factories, the cars passed through Sterling and Brush, and over good roads, which a few years ago were but trails, into Fort Morgan.

At Fort Morgan, the tourists left the Platte River to cross the rolling prairies, probably the greatest cattle country in the United States. Twelve miles from the fort, after ascending one of the long grades so frequent in this country, they were thrilled with the first sight of the snow-capped Rocky Mountains. For 65 miles they had seen no evidence of human habitation except a few ranches. Then came the town of Bennett, a live, up-to-date place of 300. Unlike the experience of the Glidden tourists of 1909, when it was necessary to stop and open the gates from ranch to ranch, and to find their own trails, the tourists found the route well marked with the sign posts

of the Denver Motor Club, the roadway running between wire fences on each side just as it is in the thickly populated districts of the East. They reached Denver over this type of road.

Contrary to the usual belief, which is that Denver is in the mountains, they found it 14 miles from the foothills of the Rockies with the famous Pike's Peak 75 miles south. The trail led to the north of Denver and through the first of the reclaimed land, which showed the effects of the work of the United States government and a private corporation's irrigation projects.

The altitude had changed from sea level to 5,280 feet. The change, however, had been so gradual as to be hardly perceptible. The rarefied atmosphere had no ill effects on the occupants of the cars nor on the operation of the cars themselves.

They then passed through the towns of Lafayette, Loveland and Fort Collins—another remarkable example of Western town hustle and architecture. Leaving this town the trail changed to the northwest going into the foothills of the great Rocky Mountains to LaPorte to Forks Hotel, a stage station on the route to the famous Estes Park of Colorado, which lies 25 miles due west, but of the transcontinental trail which leads Northwest.

Getting Up Into the Mountains

THE going here was reasonably fair except when wet. Unfortunately the party was caught in a cloudburst at this point and was compelled to spend the night at the Forks. The road is adobe, which differs only from gumbo in that it is about 25 per cent. slipper and stickier.

From here on the real mountain experiences began. The approach to the Wyoming line was marked by steep climbs of from 15 to 25 per cent. The trail of the Rocky Mountains leads to canyons which are different from the Sierra Nevada Mountains of the coast. At no point did the tour actually go over the top of the Rocky Mountains, whereas in the far western ranges the roads go straight over the tops as they do in Pennsylvania. Virginia Dale is the last town before the trail leads into Wyoming.

The direct route for transcontinental touring lies from Julesburg west to Cheyenne, Wyo., and from thence to Laramie. The shortest way is direct to Laramie, but this cuts out the very interesting town of Cheyenne, the capital of Wyoming, which has one of the largest barracks and forts of the United States government in the West.

All in all, the roads are good through Colorado, barring rain. The tour averaged through this state nearly 160 miles a day.

Wyoming—After crossing the Colorado-Wyoming line the

grade was constantly up until Tie Siding was reached, the highest elevation of the trip, somewhat over 8,000 feet. This is the divide between the plains of Colorado and the Laramie plains of the west. At this point the tour also began running parallel with the Union Pacific Railroad, which, with the Central Pacific, it followed practically to San Francisco, with the exception of the detour West around the head of Salt Lake to Ogden, Utah, and to Lucin.

From Tie Siding practically all the ballast used on these railroads, both east and west, has been taken. It is considered the greatest railroad building material in the United States.

From Tie Siding to Laramie the running was excellent. Here were found the most courteous people, glad to extend the hand of welcome to Easterners, and willing to go even beyond reason to make them comfortable and to aid them on their way.

From Laramie, over 73 miles of plains, they went to the town of Medicine Bow, made famous by Owen Wister's great book, "The Virginian." In this place, 75 miles from habitation, besides the ranch houses of the sheep and cattle men, there is being built a modern cement hotel with seventy rooms, with bath and running water.

From now on look out for high centers. Eight miles west of this town, where the road runs apparently smooth, there is a rock with a drop of over 18 inches. Three cars which had preceded the party came to grief at this point, the cars dropping on the rock, breaking crankcases, and in one instance driving the connecting-rods through the cylinders, costing in both instances weeks' delay in Medicine Bow until new parts could be shipped them. One of these cars was of foreign make and was forced to abandon its attempt to break the transcontinental record.

High Clearance Becomes Necessary

TWELVE miles from Medicine Bow they passed an abandoned town. This had once been a thriving town of not less than 1,000 people and there remained the ruins of over 100 houses. The people left because the coal came to an end. Here also was crossed the Medicine Bow River, where the "Virginian" rescued the schoolma'am.

From here on the value of high clearance became more apparent. The cars showed 11 inches, which was sufficient to run in the trails at a speed of from 20 to 22 miles an hour, whereas 1 inch less would have required straddling the trail at a speed not to exceed 10 or 12 miles.

Aside from a few very deep washouts or arroyos and steep banks along the abandoned railroad grades, which were used as roads, the going was fairly good. They averaged through this country 150 miles per day.

Fort Steel was the next town. Here they again crossed the North Platte River, the source of which is from the melting mountain snows. The run from here to Rawlins, Wyo., is excellent. At Fort Steel the natives said that the bridge was down and that it would be necessary to travel along the railroad ties and use the railroad bridge. When the tour arrived it was found that a modern up-to-date steel bridge was in place. This incident is mentioned to show how unreliable is the roadside information.

From Rawlins the climb is constant up to Creston, which is located on the great Continental Divide. This spot was formerly marked by a large wooden sign, which the storms of the winter have blown down. The only marking place now is the gravestone of James Yort, whose remains were buried at the apex of the Divide 10 years ago.

The hunter will be interested to learn that here are the great hunting grounds. The tourists saw flocks of sage hens, the finest eating of all the game birds, thousands of jack rabbits, badgers, coyotes, and were told of many bear and deer.

This also is the country for the fisherman as the streams here abound with brook trout.

From Creston West the tour entered the bad lands of the West; bad, principally because of the necessity of making one's

own trails around the seep and water holes of the alkali flats. Detours of many miles to the north and south are frequently necessary in this district.

Beyond this is the Bitter Creek district, which showed some of the worst going of the trip. It was necessary here to run along the edge of the foothills where the spring washouts had gullied the road so that it resembled driving over railroad ties. A rate of 6 miles an hour was great speed in this country. Some of the washouts here were 50 feet deep. The cars in front disappeared completely on the slide down the east side, and first speed was necessary to climb up the west side.

Rock Springs Brings Forth Budweiser

FROM Black Buttes to Salt Walls for 25 miles much sand was encountered, but the 37 by 5-inch non-skid tires saw the party through without serious difficulties.

From Salt Wells to Rock Springs proved to be pretty good going. When 10 miles from this city the tourists were met by its chief executives with a tonneau full of quart bottles of Budweiser in ice. This, perhaps, was the most unexpected courtesy of the trip.

At Rock Springs they were joined by the game warden of the State of Wyoming, who, without consideration of any kind, brought them from the Eastern parts of the bad lands of this state. His knowledge of the road was such that they had the best there was. This otherwise would have perhaps made the heaviest going of the trip. Here, also, they saw the convicts of Wyoming at work in the building of roads between Rock Springs and Green River, where the Westerner claims there is more coal than in the mines of Pennsylvania. They crossed the Green River at the town of that name. The trail from there to Bryan was exceedingly good. At this point they took up an abandoned trail to avoid two fords in the Green River because of high water.

A few miles West of Bryan they went through the deepest arroyo of the trip. The sides were so steep that the occupants of the cars, especially the ladies, insisted upon getting out. The amateur drivers, without exception, took their cars through with safety. Several arroyos not quite so deep were passed between Bryan and Granger, which was passed 1 mile to the north.

Because of impossible road conditions it was necessary to detour in a northwest direction to the town of Kemmerer and from there to Evanston. At this point the trail, for no other reason than the crankiness of a ranchman, has been fenced off with wire fencing, making it necessary to swing far to the north and south and up occasionally steep grades. In some places here it was necessary to blaze the trail. At no other place on the trip were such conditions as these.

The run from Rock Springs to Kemmerer is 100 miles and so was made in a day. From Kemmerer to Evanston is 35 miles, which was made up in less than 2 hours. A few miles west of Evanston they crossed into Utah.

2,199,645 Miles of Roads in U. S.

After an investigation extending over many months, Logan Waller Page, Director of the Office of Public Roads, has ascertained that there are now 2,199,645 miles of public roads in the United States. The figures include all the new roads built up to the year 1909. In 1904 there were exactly 2,151,379. It is apparent, therefore, that the increased mileage of new roads within a period of about five years has been 48,266.

The Office of Public Roads has just issued a table showing the states having the largest mileage of improved roads. Indiana leads in this respect, followed closely by Ohio. Each of these states has double the mileage of improved roads credited to any of the others.

	1904.	1909.		1904.	1909.
Indiana	23,877	24,955	Kentucky	9,486	10,114
Ohio	23,460	24,106	Illinois	7,924	8,914
New York	5,876	12,787	California	8,803	8,587
Wisconsin	10,633	10,167	Massachusetts	7,843	8,463

In the Legal Field

Railroads Answer N. A. A. M. Suit— Prest-O-Lite After Infringer

Await Carlson vs. Maxwell Decision—Company Promoter Disappears—Washington Reorganization

WASHINGTON, D. C., Feb. 19—Twenty-one railroad companies have so far answered the complaint filed by the National Association of Automobile Manufacturers against seventy railroad companies charging excessive freight rates on shipments of motor cars. Each answer is couched in practically the same language and is a general denial that the classification and rates on automobiles are unjust, unreasonable or unjustly discriminatory, or in violation of the interstate commerce law and praying for the dismissal of the complaint. The railroad companies had until February 19 to file their answers. The Interstate Commerce Commission has docketed the case and will take it up at some future time. No one connected with the Commission is able to state just when the case will be called for hearing.

Prest-O-Lite Enjoins an Infringer

TRENTON, N. J., Feb. 20—A preliminary injunction has been granted to the Commercial Acetylene Company and the Prest-O-Lite Company against Camille Bournonville, a supply man of Newark, N. J., prohibiting him from infringing the patent under which the Prest-O-Lite company is operating.

It was shown to the court that the defendant filled gas tanks for his customers in contravention to the patent rights held by the complainants. The patent in question was granted to Claude & Hess and is numbered 664,383. The inventors assigned the patent to the Commercial Acetylene Company, which in turn licensed the Prest-O-Lite company.

There have been numerous litigations based upon this patent and one case went as far as the United States Circuit Court of Appeals of the Sixth Circuit, resulting in a victory for the patentees.

In the present case a relatively small amount of money is involved.

Court Upholds Truffault Patent

TRENTON, N. J., Feb. 20—The United States Circuit Court of Appeals for the Third Circuit has handed down an opinion sustaining the ruling of the court below in upholding the Truffault patent covering the rotary friction idea in shock absorbers. The defendant in this action is the Weston Manufacturing Company, of Jersey City, which was sued by the Hartford Suspension Company, licensees under the Truffault patent, for infringement. The patent at issue was granted on re-issue in the month of January, 1906.

The Hartford company has an action still pending against the Connecticut Shock Absorber Company, based on a different patent, No. 803,589, granted in 1905. This suit was commenced last year and is still in the United States District Court awaiting a hearing.

Rescue Planned for Washington

WASHINGTON, D. C., Feb. 19—The Washington Car Manufacturing Company is now being organized by the present officers and directors of the Carter Motor Car Corporation. Thirty additional representative business men of Washington, D. C., and Hyattsville and Bladensburg, Md., will be added to the present directorate.

Carlson vs. Maxwell Opinion Soon

In much more detail than at the previous hearings, the litigation between the Carlson Motor and Truck Company and the Maxwell-Briscoe Motor Company was presented to the United States Circuit Court of Appeals on Friday of last week and Monday of this. The case is one of great importance to the industry and has been handled in exhaustive fashion by both sides.

As has been stated in these columns, the suit involves the validity of claim 1 of patent 797,555 granted to Carlson on an improvement of a cover-plate for a motor having opposed cylinders, which contains the valve-actuating mechanisms.

The case was taken to this court on behalf of the defendants after a ruling adverse to them in the lower court.

The defense put forward two new lines of argument in much detail, namely, the Walrath and Maxim defenses, and touched upon two lines that formed the chief elements of the defense in the lower court. The new defenses embrace devices covered by patents 832,859 and 645,177. The first of these covers a stationary engine principle and the second, the type of cover plate used by the Pope Manufacturing Company and in single-cylinder De Dion motors.

The close reasoning and arguments in favor of showing by analogy that these patents antedated the purpose of the Carlson device were carefully heard by the court.

Union Company Promoter Disappears

COLUMBUS, O., Feb. 19—Considerable mystery surrounds the actions of a man giving the name of J. W. O'Brian, the promoter of the Union Sales Company, who did extensive advertising in the technical and daily papers. About 3 weeks ago his office at 61 E. Spring street, on the second floor of the Central Ohio Automobile and Garage Company, was deserted, Mr. O'Brian having left for parts unknown. It was reported that he had gone to Omaha.

At the Dunlap Engineering Company, where he was having the Union 25 assembled, it was stated that the whereabouts of Mr. O'Brian was unknown. He is supposed to have come from the South, and the Primo deal at Atlanta, Ga., is said to have been one of his promotions which failed after a few months of apparent success. His plan, as far as can be ascertained, was to secure deposits from local agents and if they were sufficient, to attempt to complete the car, which was to sell for \$650. It is known that he secured deposits totaling between \$1,500 and \$2,000, which he is supposed to have taken with him as he did not settle any bills while in Columbus. He failed to pay his office rent and when the Dunlap Engineering Company asked for compensation for work done in assembling the first car he was unwilling to pay and the materials at the plant were attached to settle the bill.

Manager Dunlap, of the Dunlap Engineering Company, which attached the unfinished car and materials, is now negotiating with a view of reorganizing the concern, completing the car and putting it on the market. He says the car as specified by O'Brian can be built for \$650 and that there is every reason to believe that it will be moved to another town and a factory established.

Bankruptcy Trustee Alleges Fraud

SOUTH BEND, IND., Feb. 19—Suit demanding \$25,000 judgment and to set aside sale of real estate and personal property by the Elkhart Motor Car Company to the Elmer Automobile Company, on the ground that the transfer was fraudulent, has been filed in the Superior Court at Goshen, by Glen B. Sawyer, trustee in bankruptcy of the Elkhart Motor Car Company. It is alleged that the transfer of property was made within four months prior to the filing of the petition in bankruptcy with the intent of defrauding the numerous creditors of the Elkhart Motor Car Company.

Detroit to Regulate Headlights

DETROIT, MICH., Feb. 19.—The ordinance committee of the Detroit common council has instructed the corporation counsel to draw up an ordinance, patterned somewhat after the New York ordinance, regulating the use of glaring headlights on automobiles. The ordinance will contain a provision that exceedingly bright lights shall be so tilted that they will not cast their rays more than 300 feet ahead of the car. Alderman Allan, chairman of the committee, will try to have incorporated in the ordinance a provision requiring tail lights on all pleasure cars.

Chauffeur Gets Year Under New Law

BALTIMORE, MD., Feb. 19.—For the first time since the passage of the law a court sentence was imposed for a motor car running into and killing a man. Earl Bowman, the chauffeur, was sentenced by Judge Gorter to a year in jail on the charge of running into and killing George Gordon, an aged watchman on the Edmondson avenue bridge. It was charged that Bowman not only ran into and killed Gordon, but that he and other young men in the motor car drove off after the accident without stopping to care for the injured man.

Wheel Tax to Go to Supreme Court

WASHINGTON, D. C., Feb. 20.—It was learned today that Leroy Mark intends to carry to the Supreme Court of the United States a test case of the so-called wheel tax. Mark has been assured the support and co-operation of a large number of automobile owners in the effort to have the highest court in the land pass upon the law, which recently was held to be constitutional by the District Court of Appeals. The motorists of the District of Columbia feel the tax is an injustice, in view of the number and amounts of other taxes they have to pay. The revenue from the wheel tax law, it is said, will amount to more than \$50,000 a year, the tax being \$3 on cars seating two persons and \$2 for each additional seat.

Free Licenses for Jersey Tourists

ASBURY PARK, N. J., Feb. 19.—With a look ahead, in view of the possibility that the New Jersey lawmakers may not have enacted favorable legislation by that time, the hotel and business men of this resort have requested Commissioner J. B. R. Smith to restore for the month of April, the Easter season, the 8-day dollar touring privilege which was revoked last July. It is the intention of the suppliants, in the event of a favorable reply to their request, to issue a free license for the month of April to every out-of-the-state automobilist applying to them for same. On the receipt of such application a blank will be mailed to the prospective visitor, who on filling it out, will receive by next mail a free license for the month.

Several Cities Seeking Edwards Plant

NEW YORK, Feb. 20.—The new Edwards Motor Car Company, which is being organized by C. G. Stoddard and H. J. Edwards, has taken temporary offices at 437 Fifth avenue, in this city, where the details of organization of a company are being looked after. The final contract with the Knight & Kilbourne Company for the purchase of a license to use the Knight double-sleeve valve type of motor was sealed and delivered last week, so that the company is now open to go ahead in its organization.

Citizens in Indianapolis, Ind., are making a special bid for the company. At a meeting called by some of the citizens in that city over \$200,000 was offered and a few days later this amount was reported as raised to nearly half a million. But Indiana is not alone in bidding for this new company. From an Eastern city has come almost equally favorable offers.

Stops Retail Selling

United States Tire Company Will Deal Only in Quantity

Six Months' Records Show That Minneapolis Municipal Cars Are Economical in Operation

NOTICE has been mailed by the United States Tire Company to 18,000 dealers in tires and supplies that from the date of the notice the company would abandon the retail selling field in toto. Ever since the formation of the company it has done a large business through its branch houses at retail, dealing directly with consumers.

Placards have been hung up in all branch houses of the company announcing that no retail business would be accepted. In the letter accompanying the notice to dealers, the company states that the reason for the move is to show its appreciation for the support given the company by the dealers generally. The new order is effective February 21.

The direct factory branches of the United States Tire Company are divided into three great territories: divisions of the East, West and Center. The Eastern division includes the following branches: Atlanta, Boston, Buffalo, Hartford, New York, Philadelphia, Pittsburgh. The Central division includes these: Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Louisville, Minneapolis, San Antonio and St. Louis. The Western division embraces these: Denver, Fresno, Los Angeles, Portland, Salt Lake City, San Francisco and Seattle.

Record of Minneapolis Service Cars

MINNEAPOLIS, MINN., Feb. 19.—This city has established a municipal garage with shop for repair work and maintains an accurate record of upkeep cost against the various departments. The record has been maintained six months and includes such details as expenditures for oil, gas, new parts, tires and casings and repairs. The record for price, date of purchase, monthly expense, total mileage and total cost is as follows:

	Total Expense a month	Average Mileage a month	Cost per mile
Street Lighting			
Maxwell, roadster—\$728, July, 1910.....	\$123.39	1,827	\$.06
Waterworks Department			
Buick, 5-passenger, street service, \$1,075, June, 1909	38.06	798	.04
Mitchell, 5-passenger, engineers, \$1,000, May, 1910..	231.64	1,219	.19
Schacht, truck, tapping, \$749.50, May, 1910.....	20.76	511	.04
Van Dyck, truck, tapping, \$850, May, 1911.....	49.43	787	.06
Hudson, roadster, city engineer, \$1,150, June, 1910.	68.88	535	.13
Engineering Department			
Buick, 5-passenger, paving.....	51.09	908	.66
Vellie, 5-passenger, Sowers.....	46.44	540	.09
Mitchell, 5-passenger, Sowers.....	34.45	1,093	.03
Buick, roadster.....	9.83	250	.04
Police Department			
Headquarters	83.88	1,429	.06
Patrol, first precinct.....	86.42	747	.12
Patrol, third precinct.....	73.58	624	.12
Ambulance	32.53	321	.10
Average per car.....	\$67.88	892	\$.08

Holbrook Takes Charge of Ames

OWENSBORO, KY., Feb. 20.—Newton D. Holbrook, formerly manager of the Pope-Hartford Automobile Company, at Torrington, Conn., has taken charge of the Ames Motor Company of this city as manager. Mr. Holbrook has announced that a new model will be made and stated that he expects it to materialize in a few weeks.

To Stop Making Corbin Cars Corporation Has Disposed of 1912 Product to Miner Garage Company

NEW BRITAIN, CONN., Feb. 17—The Corbin Motor Vehicle Corporation of this city has decided to discontinue the manufacture of Corbin automobiles, the making of which has been carried on in this city since the summer of 1903. The manufacture of the different Corbin models, including the 30 and 40 horsepower cars, will be discontinued as soon as the stock on hand can be absorbed. After that date the Corbin Motor Vehicle Corporation will not be dissolved, but will continue for probably 4 or 5 years and limit its activities to that of the maintenance department for the benefit of the present owners of Corbin cars. It is not the purpose of the company to dispose of its manufacturing machinery, etc., all of which will be absorbed by the American Hardware Company.

Simultaneously with this announcement comes that of the Corbin Motor Vehicle Corporation having disposed of its entire 1912 output of cars to the Miner Garage Company, of Hartford, Conn., which concern will sell during the coming season the different Corbin models fully equipped according to catalogue specifications. This deal with the Miner Garage has been made under a guarantee that the Corbin Motor Vehicle Corporation will furnish at reasonable prices all needed parts to purchasers of these cars and that they will continue a repair shop and garage as stated above for the benefit of Corbin owners.

The Corbin Motor Vehicle Corporation is a subsidiary company of the American Hardware Corporation, composed of the P. & S. Corbin Company and the Corbin Lock Company, and the manufacture of automobiles has been carried on in departments of the American Hardware Corporation, these departments, however, being entirely separate from the hardware department and the business of the motor vehicle department being conducted separately. General regret is expressed throughout New England at the discontinuance of the Corbin car, which, although never produced in large quantities, has always been a most satisfactory product.

Western U. S. Tire Head at Chicago

The following notice has been sent out by the United States Tire Company:

"Joseph C. Weston, Western district manager of the United States Tire Company, at San Francisco, is to take charge of the Central district territory of the company, with headquarters at Chicago. C. A. Gilbert, who has been assistant to O. S. Tweedy, Eastern district manager, New York, has been promoted to the Western district as manager and has left for San Francisco to take up his new work."

H. M. Swetland in Truck Field

H. M. Swetland, formerly head of the Class Journal Company, has been elected chairman of the board of directors of Wyckoff, Church & Partridge, Inc., manufacturers of the Commer truck and Guy Vaughan car.

The company recently turned out the first of its new trucks and a big factory run will be produced immediately.

Kelly Heads Republic Sales

YOUNGSTOWN, O., Feb. 20—John H. Kelly, recently appointed manager of the motor car tire department of the Republic Rubber Company, has been promoted to the position of acting general sales manager of the Republic company with control not only of sales in this country but the foreign business as well.

Supply Houses May Organize

Conditions in the automobile supply trade of New York have been considerably mixed for some time, and a meeting was called last Saturday to consider ways and means of correcting some of the more glaring of them. The meeting was held at one of the Broadway stores, and was attended by quite a representative gathering of the local automobile sundry dealers.

The chief element of complaint was that while trade is of gratifying proportions, a considerable factor that ought to produce profit was not so producing. Various theories were advanced to account for this condition. One of the chief speakers said that the local trade had been subjected to unfair selling conditions in being obliged to compete for an important part of the trade against an organization that has been receiving price concessions from manufacturers and jobbers.

Several plans of organization were considered and discussed at some length, and the matter of forming such an organization will be taken up seriously at another meeting which will be called in about 2 weeks.

One of the companies represented had its attorney at the meeting to pass upon the likelihood of coming in contact with the Sherman law in case a hard and fast association was formed.

Humpage New Thomas Head

BUFFALO, N. Y., Feb. 20—At a special meeting of the directors of the E. R. Thomas Motor Car Company of Buffalo, F. R. Humpage, of 22 Bidwell Parkway, this city, was chosen president of that plant to succeed Edward P. Chalfant, who resigned last week to enter business in New York.

W. L. Gleason was elected vice-president and J. J. Ramsey was re-elected to continue in the office of secretary and treasurer. With the exception of the retirement of Mr. Chalfant from the Thomas concern, the entire personnel of the plant remains unchanged. Messrs. Humpage, Chalfant, Gleason and Ramsey came to the Thomas Company a year ago from Detroit.

Two Companies Abandon Racing

Gracefully acknowledging the service speed contests have served in developing the automobile, the Lozier Motor Company and the Abbott-Detroit Motor Company have announced their withdrawal from racing. The Lozier company started racing in 1907 and in winning the last Vanderbilt cup race, crowned its brilliant record in this respect. It specialized in long distance contests.

The Abbott has been a participant in speed events for 2 years and in its class made an excellent showing in both long and sprint distance races.

Isotta Owner Takes Dyer Licences

Individual licenses under the Dyer patents have been granted to several automobile owners during the past week in and around New York. The most significant move in this direction was noted with regard to Isotta cars. Dr. C. F. Pratt, of Brooklyn, owner of a car of this make, was granted a license after the American representatives of the factory decided not to make a legal test based upon an individual case.

Studebaker to Fund Floating Debt

In order to fund the floating indebtedness of the Studebaker Corporation without increasing its bonded debt, an issue of \$8,000,000 of 5 per cent. gold notes will be marketed through the bond house of Goldman, Sachs & Company at some date between March 1 and 15. The bonds will be in serial form and 1-20 of the issue will fall due each 6 months, beginning with September, 1912.

Gotham Dealers Elect New Board

The annual meeting and dinner of the Automobile Dealers' Association of New York, was held Thursday evening. President John E. Plummer reviewed the work of the association in 1911 and told of what had been done to secure the present branch office of the Secretary of State for this city and of the various changes that have been made in the existing automobile law, particularly as to the division of the year so that purchasers of cars after August 1 do not have to pay full fees for registration.

The following were selected as the new board of directors: M. J. Budlong, R. D. Garden, John F. Plummer, C. P. Skinner, F. Eveland, H. M. Bronner, C. M. Brown, W. S. M. Meade, Arthur M. Day and A. L. Newton.

Pigginses Will Make Trucks

RACINE, WIS., Feb. 19—The incorporation of the Piggins Motor Truck Company, with a capital stock of \$125,000 marks the evolution of a well-known manufacturer of motors as a builder of commercial vehicles. Many years ago C. B. and F. H. Piggins, brothers, started the manufacture of gasoline engines and specialties. Three years ago they became makers of truck and pleasure motor cars. For some time past they have been building complete cars and trucks, and now have decided to devote all their energy to the production of trucks. The factory and machine shops will be enlarged and the output increased before the beginning of summer.

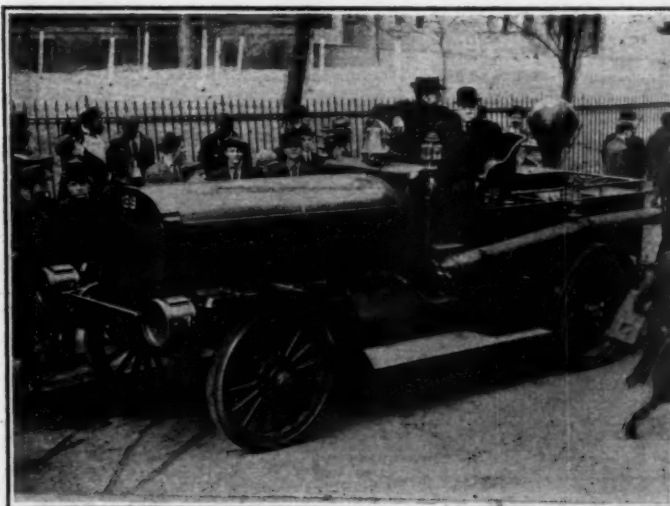
Colby Will Move to Davenport

DAVENPORT, IA.—The Western Implement Motor Company, which recently took over the Colby Motor Company of Mason City, Ia., has purchased an 80-acre tract of land comprising the old Davenport mile track northwest of the city and will establish a town to be known as Appleby in honor of J. F. Appleby, vice-president of the company. The purchase price was \$35,000.

Big Motor Pump Displaces Fire Horses

First among the gasoline pumping and propelling fire engines to be installed in the New York Fire Department is a monster six-cylinder Waterous automobile which has been stationed at Thirty-nine's house, which is located at headquarters.

The new apparatus displaces five horses and their equipment. The car is rated at 126 horsepower and uses the propelling motor for pumping water. In its official tests the car made over 40 miles an hour and threw 744 gallons of water per minute. The apparatus was built by the Waterous Engine Company, St. Paul.



Prest-O-Lite Will Remain

Indianapolis Allows Company to Locate Plant Within the City Limits

INDIANAPOLIS, IND., Feb. 19—An ordinance satisfactory to the Prest-O-Lite Company, making it possible for the company to locate its gas manufacturing plant inside the city limits, has been passed by the city council and the company states it will not move to another city. It had contemplated moving away, because for several years its gas manufacturing plant has been 5 miles south of the city, an ordinance forbidding the maintenance of such plants inside the city.

The new ordinance stipulates that a plant of the character conducted by the Prest-O-Lite Company shall not be closer than 100 feet to any public highway or other building nor closer than 1 1-2 miles to the center of the city. The plant must be enclosed and warning signs posted at each side of the enclosure.

The ordinance also prescribes the manner in which the gas must be manufactured, charged and stored and in the latter respect also affects garages. Where there are from twenty to twenty-five tanks to be stored they must be placed in a fireproof, self-closing box, and where there are more than twenty-five such tanks they must be kept in fireproof vaults.

A site for its new plant is now being sought by the company, and a building 100 x 250 feet will be commenced within the next few weeks.

Old Mitchell Officers Re-Elected

RACINE, WIS., Feb. 19—At the annual meeting of stockholders of the Mitchell-Lewis Motor Company, the officers and directors were re-elected as follows: chairman of the board, William T. Lewis; president and general manager, William Mitchell Lewis; first vice-president, G. B. Wilson; second vice-president, J. W. Bate; secretary, G. Vernon Rogers; treasurer, Frank L. Mitchell; assistant secretary, G. E. Redman; assistant treasurer Wm. H. Armstrong; counsel, M. J. Gillen; European head, Henry Plow.

Racine Body Makers Reorganize

RACINE, WIS., Feb. 20—The Racine Manufacturing Company, maker of automobile bodies, has reorganized increasing its capital stock from \$400,000 to \$800,000. F. K. Bull, threshing machine manufacturer, is the new president. J. W. Gilson, formerly Mitchell sales manager, is vice-president. G. W. Jaegers is treasurer and Harold Smith, secretary.



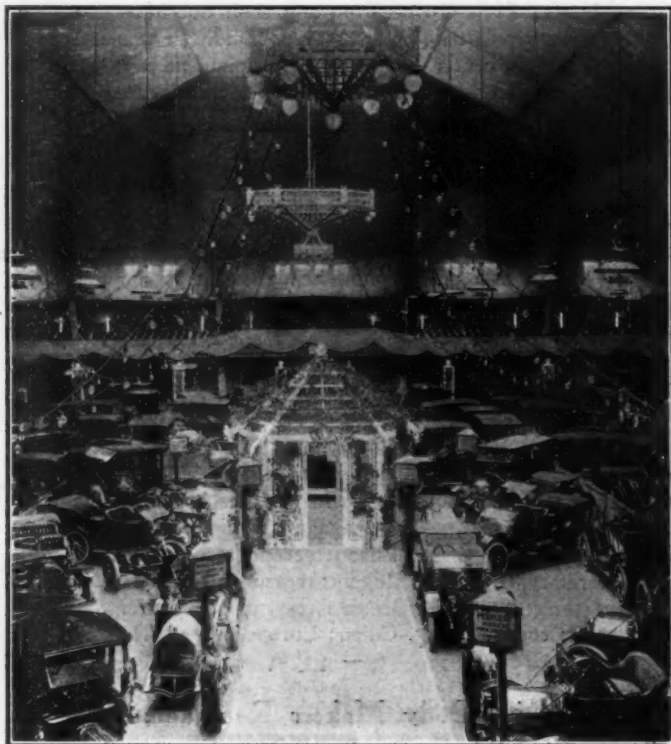
Motor pump and hose wagon which have replaced horse-drawn apparatus at No. 39's house in New York

Newark's Show Opened

Representative of the Automobile Industry of New Jersey

Metropolis of State Becoming a Great Center of Commercial Car and Accessories Manufacture

NEWARK, N. J., Feb. 19—Representative of the automobile industry of the entire state, the fifth annual show of the New Jersey Automobile Exhibition Company was opened in the First Regiment Armory last Saturday night under



Looking down the center aisle at the Newark Show

circumstances quite in accord with its importance. The products of no less than seventy-four automobile factories are being displayed by fifty-nine agencies or branch houses. Of these an even sixty are pleasure cars, the remaining fourteen being commercial vehicles. In addition there are twenty-eight exhibits of accessories of various kinds—the whole forming an exposition which, while it includes the products of factories located in almost every state in the United States, is peculiarly representative of New Jersey and of Newark itself.

Aside from the fact that within a 10-mile radius of this city are located some of the largest manufactories of automobile accessories in this country, such as electric horns, shock absorbers, carburetors, windshields, radiators, bearings, wood wheels, electric lighting devices and a score of other similar products, Newark is beginning to assume importance as a commercial vehicle manufacturing center. Here are already located the Newark, Lansden, W. L. S., formerly Commercial, and Bronn-Sauter factories, not to mention an addition to the main Mack plant and the Saurer establishment at Plainfield. Arrangements are under way for the forming or transfer of similar concerns. The comparative cheapness of factory sites here and the propinquity to the metropolis is the combination that is forcing Newark to the fore in this respect.

As many of the exhibits have come direct from New York and Chicago, the general effect of the show, remembering the liberal dimensions of the armory, is almost national. This effect is heightened by the presence of many metropolitan managers and salesmen and other trade high-lights.

The show is nominally under the auspices of the First Regiment, N. G., N. J., but its direct management falls upon the Exhibition company which has the benefit of the co-operation of the New Jersey Automobile Trade Association, composed of dealers from every part of the state. Horace A. Bonnell, who is general manager of the Automobile Board of Trade, is managing the show with the assistance of C. C. Dawkins.

To properly provide for the entertainment of visitors, tonight has been set aside as Club Night. Tomorrow will be Dealers' Day; Wednesday, Society Night; Thursday, Military Night, and Friday, Good Roads Day. As an indication of the growing importance of the show as a state-wide institution, the management, which up to this year had provided quarters for the local club only, has been compelled to so widen the scope of its hospitality that it now includes all the clubs in the northern half of the state. Friday's Good Roads convention will attract enthusiasts from all over the state granges, boards of freeholders and other prominent organizations have named delegates, and



There is a liberal display of commercial vehicles at New Jersey's representative show



Accessories occupy three sides of the gallery which completely surrounds the Armory building

speakers of national importance—Logan Waller Page among them—will deliver addresses.

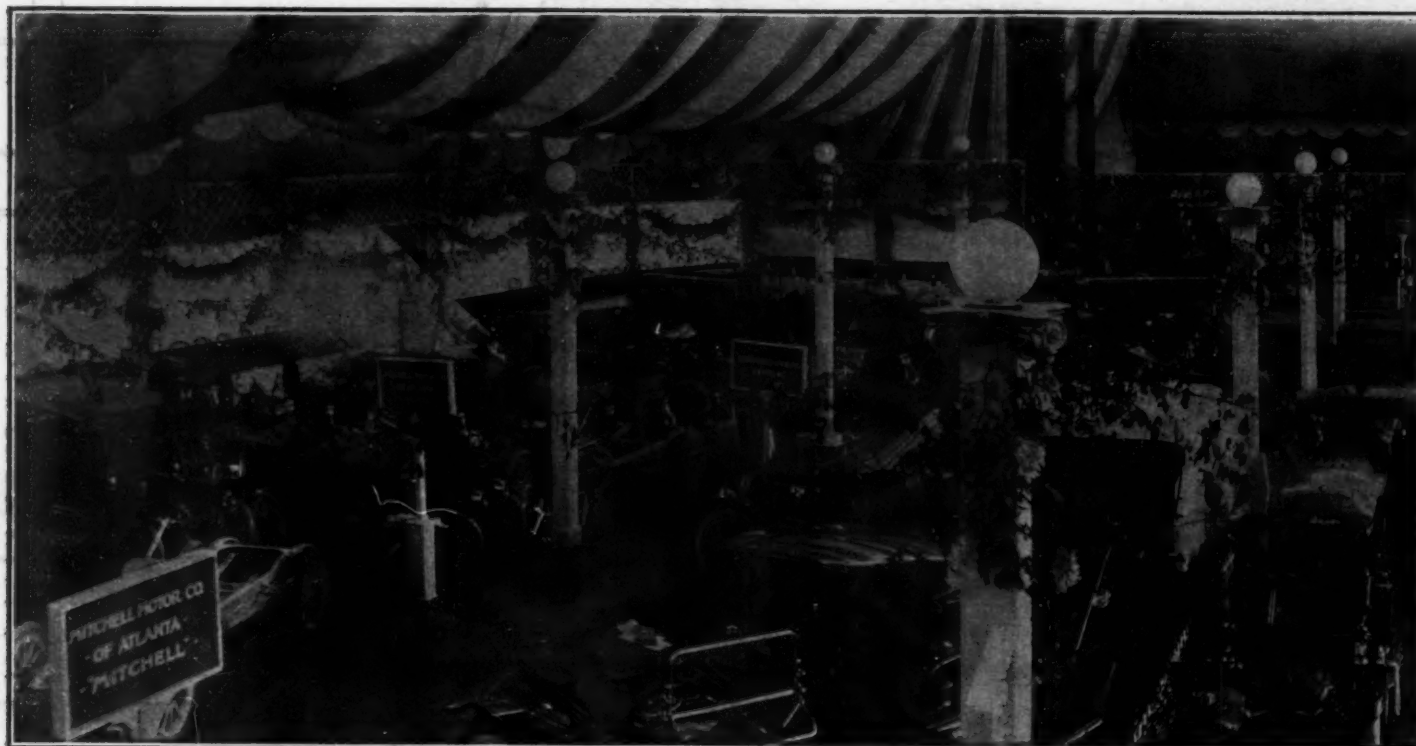
In officially opening the show, Curtis R. Burnett, president of the Newark Board of Trade, called attention to the prominent place that New Jersey in general, and Newark in particular, has assumed in automobile manufacturing and allied trades. Over 20,000 men, he said, are employed in such industries in this state, in addition to which there are upwards of 500 garages with more than 3,500 employees and 7,000 chauffeurs. Mr. Burnett urged the state legislators to consider the vast and growing importance of this trade to New Jersey and to do all they can toward bringing about proper legislation, "so that residents of our state may treat the automobilists of other states in

the same manner as all of the other states in the Union are treating each other. We must have reciprocity on an honorable basis if we wish to retain the volume of business we now have, and at the same time secure a larger share from the manufacturers who are now discriminating against Newark and New Jersey whenever they have an opportunity, owing to the fact that they are barred out of the state unless they comply with arbitrary and inconvenient rules."

While it is too soon to forecast the value of the present show as a trade-quickener, it is almost certain that in this respect it will far outclass previous local exhibitions. Newark is the entrepot to the northern half of the State of New Jersey; previous years have witnessed the placing of numerous agencies and sub-



General view of the Fifth Annual Newark Show, looking from the northwest gallery



Panoramic view of the installation of the more than one hundred exhibits at the Atlanta Auditorium-Armory during

agencies through the local branch houses; all the local plants which turn out automobiles and accessories are represented—these conditions, along with the fact that from its beginning, 6 years ago, the Newark show has registered hundreds of retail sales, would seem to warrant the optimistic predictions of the exhibitors and the management.

Right at Newark's doors lies that opulent region known as The Oranges, dotted with the palatial homes of tens of thousands of New York's successful business men. These men of money usually wait for the annual Newark show before investing in a new car; they flock to the show by hundreds, bringing their wives and children with them. Last Saturday night the streets north, south, east and west of the armory on Sussex avenue were fairly choked with the automobiles of this class of patrons. They will visit the show several times during the week, and the last day or two will witness broken records in retail selling. It has always been so. Those who aver that local shows do not pay will have a hard job convincing the Newark exhibitors that such is the case.

Newark Favors Medium-Priced Car

While the medium-priced car—from \$2,000 to \$3,000—is the favorite in the Newark section, all the representatives of the more costly automobiles who were interviewed by THE AUTOMOBILE man were enthusiastic over the prospects for the coming season. There is a noticeably small proportion of the less-than-\$1,500 class to be found in and around Newark, while the electric is just beginning to acquire followers. The hills of north Jersey—the most delightful touring ground in the country—call for reasonably high power, which possibly accounts in large measure for the comparative scarcity of the small car.

The past year has witnessed a most remarkable spurt in the commercial car fields in the Newark section. The excellent work done on long hauls by the vehicles of Gotham's big department stores has been a daily object lesson of which local merchants have not been slow to take advantage. The establishment of commercial car factories here within the past year or two has also had a beneficial effect. Local department stores, grocers, bakers and merchants are experimenting with motor delivery; some have already gathered together a sizable equipment. The virtues of motor apparatus have begun to appeal to

the Newark fire officials, and half a dozen pieces are already in service. The local prospects in the commercial car line may be said to be distinctly good.

Among the new accessory exhibitors were:

Brown's Perfection Tube Company, New York City—This company makes tires, the inner tubes of which fit tightly against the inside of the casing, so that in case of a blowout the air

LIST OF EXHIBITORS AT THE NEWARK SHOW

Pleasure Cars

Apgar & Apgar, Lion and Pullman.
Baker Motor Vehicle Company, Baker electric.
Alexander Brunner, Klinekar.
Buick Motor Company, Buick.
E. D. Carlough, Franklin.
Central Motor Car Company, Regal.
Chace & Bradley, Borland electric.
Cunningham Brothers, Havers.
Detroit-Cadillac Motor Car Company, Cadillac.
Ellis Motor Car Company, Pierce-Arrow.
E-M-F Flanders Newark Sales Company, E-M-F, Flanders and Studebaker electric.
Empire City Automobile Company, Paige-Detroit and Warren.
Greene Motor Car Company, Locomobile.
Haynes Automobile Company, Haynes.
Herreshoff Company of New Jersey, Herreshoff.
H. Heinsheimer, Palmer-Singer.
Hupp Corporation, Hupp-Yeats.
Junction Motor Company, Cutting.
H. J. Koehler Sporting Goods Company, Hupmobile.
Lenox Motor Car Company, Crow-Elkhart.
Linkroom Automobile Company, Winton.
Martin Automobile Company, R. C. H. and Mitchell.
J. W. Mason, Columbia and Maxwell.
J. J. Meyer, Auburn.
New Jersey Automobile Company, Moline.
Newton-Humphreys Company, Thomas and Everitt.
Oakland Garage, Oakland.
Oldsmobile Company of New Jersey, Oldsmobile.
O'Neil Motor Car Company, Krit and Paterson.
Overland Sales Company, Overland.
R. M. Owen & Company, Reo and Premier.
Packard Motor Car Company, of New York, Packard.
Paddock-Zusi Motor Car Company, Chalmers.
Peerless Motor Car Company of New York, Peerless.
Penn Motor Car Sales Agency, Penn.
J. M. Quinby & Company, Simplex, S. G. V. and Isotta.
R. & L. Company, Garford.
A. Elliott Ranney Company, Hudson.
Rickey Machine Company, Marmon.
A. G. Spalding & Brothers, Stevens-Duryea and King.
Stoddard Motor Company, Stoddard-Dayton.
Stutz Motor Car Company, Stutz.
Van Deman & Wainwright, Abbott-Detroit and Regal.
Van Vleck & Kirkby, Metallurgique.
Wallace-De Wilde Company, Cole.
Weldon & Bauer Company, National.



the recent show when thousands of automobile enthusiasts from every State in the South flocked to the exhibition

cannot escape through the puncture, but is held inside the tire by lateral compression to which the tube is subjected.

Suspended Pneumatic Tire, New York City—This product is an inflated tube arranged between the axle and the spring in a manner somewhat similar to the installation of a shock absorber. The maker states that while the pneumatic suspension is subject to less wear and tear than when a tire is used, very satisfactory results are obtained by its use.



LIST OF EXHIBITORS AT THE NEWARK SHOW

Commercial Vehicles

Buick Motor Company, Buick.
Commercial Maintenance & Motor Company, Grabowsky.
Commercial Motor Truck Const. Company, Commercial.
Crescent Automobile Company, Mack and Saurer.
Ellis Motor Car Company, Pierce-Arrow.
Hoagland-Thayer, Inc., Commer.
H. J. Koehler Sporting Goods Company, Koehler.
F. L. C. Martin Automobile Company, Alco.
Newark Automobile Mfg. Company, Newark.
R. M. Owen & Company, Reo.
Packard Motor Company of New York, Packard.
Peerless Motor Company of New York, Peerless.
A. G. Spalding & Brothers, Chase.

Accessories

William Eal, Inc., baggage and tire trunks.
Joseph B. Ballentine, Rain Vision windshield.
C. B. Barker & Company, Ltd., Excelsior carbureters and Black Eagle spark plugs.
D. B. Dunham & Sons, automobile bodies.
East Orange Sheet Metal Works, sheet metal garages.
Economy Auto Supply Company, general supplies.
Essex Storage Battery & Supply Company, batteries and electric lighting equipment.
G. O. Graves & Co., automobile bodies.
Howe Rubber Company, tires and inner tubes.
Stephen Y. Jersey & Company, asbestos garage building materials.
Charles E. Muller, general supplies.
National Oil & Supply Company, Viscos oils.
Newark Rubber Tire Company, Hardman tires.
New York Auto Top & Supply Company, Friction windshields and tops.
Norben Oil & Supply Company, Norben Arctic materials.
A. Pfingstag, lamp enameling and repairs.
Pyrene Mfg. Company, fire extinguishers.
S. B. R. Specialty Company, general supplies.
Standard Oil Company, Inc., lubricants.
Suspended Pneumatic Tire Company, suspended tire.
W. S. Sheppard, Ideal oils and greases.
John H. Taylor & Brother, metal garages.
S. P. Townsend, Townsend grease gun.
Van Deman & Wainwright, Peerless tires, Higbee bottle and Brown tubes.
Wayne Oil Tank & Pump Company, gasoline storage outfits.
Western Mfg. Company, Western shock absorbers.
Werner Service Mfg. Company, Jackpump.
L. J. Wurth, Inc., general accessories.

Van Deman & Wainwright, Newark, N. J.—The Higbee hot or cold bottle is a new vacuum bottle offered to automobilists for carrying with them hot or cold drinks. This sort of bottle is found especially useful when on tours, camping trips and for picnic luncheons.

Werner-Service Manufacturing Company, Jersey City—A two-cylinder high-pressure hand tire pump is the product of this company. The pump weighs 14 pounds, is 20 inches high, each cylinder having 2 inches bore and 11 inches stroke, 80 cubic inches of air are delivered per minute by this pump at a pressure of 150 pounds per square inch.

Two Shows at Toronto This Week

TORONTO, ONT., Feb. 20—Torontonians and visiting motor enthusiasts will enjoy rival shows held simultaneously in this city from Feb. 21 to 28. The larger show, which is under the auspices of the Toronto Automobile Trades Association, the Ontario Motor League and the Ontario Good Roads Association, will be held in the Armories. There are now spaces allotted to ninety exhibitors who will show over 200 cars.

The rival show is being conducted by manager R. M. Jaffray for the Canadian National Automobile Association recently organized. This show will be held in the St. Lawrence Arena. The list of exhibitors will number more than twenty, and the class of cars will be confined almost entirely to the cheaper or popular-priced type of vehicles.

Successful Exhibition at Tacoma

TACOMA, WASH., Feb. 19—With a success far beyond expectations the Tacoma Automobile Show, which opened last week in the Tabernacle, is the magnet which has drawn a large number of visitors the past week. The show is demonstrating to the automobile dealers that the field in Tacoma and South-western Washington, instead of being divided among the faithful few, will soon be cut up by the advent of a large number of cars that have never before been represented in Tacoma. Already a large number of new agents and sub-agents have been appointed and, from all indications, there will soon be many more.

Pittsburgh's Show Crowded

Tardy Exhibitors Compelled to Take Space in Odd Corners

PITTSBURGH, PA., Feb. 17—Seldom has there been put on a show that in real beauty equalled the second annual exhibition of the Pittsburgh Automobile Association, whose doors have just been thrown open.

Exposition Hall is by far the largest auditorium in Pittsburgh. To fill it the show committee did not resort to the threadbare expedient of having stock cars brought in simply for fillers, but every car, truck and accessory exhibit is genuine. Pleasure cars occupy the center of the mammoth first floor space. On either side of the broad aisles are arranged the motor trucks. This is so far ahead of any previous exhibit of its kind in Pittsburgh as to emphasize more than ever the rapidly growing popularity of the heavy truck for delivery purposes on Pennsylvania hills and grades. Fully nine-tenths of the trucks shown are models in actual use in Western Pennsylvania, most of them in the immediate Pittsburgh district and the agencies represented fully expect to make sales of an equal number of trucks next week, judging by the interest and inquiries today.

Around the spacious balconies are the displays of accessories, more in number and decidedly more varied in their character than at the first exposition show last year. It may be remarked, in passing, that the men at the head of this exhibition know a thing or two about automobile shows and how to spend money effectively with a view to getting the highest artistic and intrinsic value for every dollar put in their hands. Thomas I. Cochrane is not only a veteran show man, but he has a rare combination of artistic and business skill that makes him singularly well fitted for his position.

With Mr. Cochrane as officers and directors of the Pittsburgh Automobile Show Association, Inc., who have worked hard to bring about to-night's opening wonder are: E. A. Williams, president; Elias Lange, vice-president; Alfred A. Buhl, secretary; Julian B. Howe, treasurer; B. F. Benson, James D. White, J. H. McClarren, E. E. Gregg and L. G. Martin, directors.

The corrected list of exhibitors announced to-night is as follows:

Pleasure Cars

Aaron Deroy Motor Car Company, E. M. R. and Flanders.
Abbott-Detroit Sales Agency of Pittsburgh, Abbott-Detroit.
Alco-Pittsburgh Sales Company, Alco and Haynes.
B. F. Benson, Moon.
Buhl-Regal Motor Car Company, Regal.
Cole Motor Car Company of Pittsburgh, Cole.
Columbus Buggy Company, Firestone-Columbus.
Correja Agency, Correja.
Craig-Center Auto Company, Republic.
East Liberty Auto Company, Paige.
Federal Motor Car Company, Oldsmobile and Ohio.
Forbes Motor Car Company, Interstate, Stutz, Warren.
Great Western Auto Company, Great Western.
Halladay Sales Agency, Halladay.
Havers Motor Car Company, Havers.
Kline Kar Motor Company, Kline Kar.
Manchester Garage Company, Staver-Chicago.
Marford, Paul, Marathon.
Martin, L. G., Rambler.
Metz Pittsburgh Sales Company, Metz.
Michigan Auto Company, Michigan.
Miller Auto Company, Crawford.
McKellip, A. H., National.
Ottomobile Company, Ottomobile.
Penn Auto Company, Alpena Flyer.
Pittsburgh Automobile Company, Oakland.
Pullman Motor Car Company of Pittsburgh, Pullman.
R. C. H. Auto Company, R. C. H.
Richardson-Neighbors Motor Company, Hupmobile.
Selden Pittsburgh Company, Selden.
State Auto Company, Dorris and DeTamble.
Thomas Motor Sales Company, Thomas.
Thompson Company, E. J., Fiat.
Union Motor Car Company, Penn "30."
Universal Motor Car Company, Lion.
Vellie Motor Vehicle Company, Vellie.
West Penn Auto Company, Detroit-Electric.
Williams-Hasley Motor Car Company, Jackson and Mitchell, Clark.

Commercial Vehicles

Alco-Pittsburgh Sales Company, Alco.
Aspinwall Auto & Garage Company, Atterbury.
Bessemer Motor Truck Company, Bessemer.
Eclipse Motor Truck Company, Eclipse.
Federal Motor Car Company, Mais.

In Full Swing at Cincinnati

Big Music Hall Houses Largest Show in the Queen City

CINCINNATI, Feb. 19—Cincinnati's Fifth Annual Automobile show under the auspices of the Cincinnati Retail Automobile Dealers' Association, was opened in Music Hall tonight.

The Cincinnati Automobile Dealers' Association is comprised of twenty-two of the most prominent retail automobile dealers in the city, who represent the best and oldest manufacturers. The following are its directors: Edward F. Herschede, chairman; Robert G. Crowthers, F. H. Miller, E. A. Kruse, George Behlen, W. G. Welboa, H. S. Leyman.

The exhibitors in the pleasure car section are: Fisher Auto & Service Company, Citizens' Motor Car Company, Olds-Oakland Company, Leyman-Buick Company, Herschede Motor Car Company, Kruse Motor Car Company. Robert C. Crowthers Automobile Company, Charles Behlen Sons Company, George C. Miller Sons' Carriage Company, Hanauer Automobile Company, Jungelas Automobile Company, Cincinnati Automobile Company, Charles Schaier Motor Car Company, Ford Motor Car Company, Heileman Automobile Company, the Acme Automobile Company, Ratliff Automobile Company, Stevens Costello Company, Franklin Automobile Company, Dr. H. C. Wendell, Payne Motor Car Company, Haberer & Company, Imperial Motor Car Company, Ohio Motor Company, Ohio Motor Car Company, Rose-Hill Garage, Cadillac Motor Sales Company, Welland Company, Eddy Automobile Company, H. E. Langdon, L. C. Denison, Moore Oil Company, F. B. Williams Company, Schacht Motor Car Company, Ratterman Motor Car Company, Coughlin & Davis, Herola Reo Company, Cincinnati Pump Company, Buiniller & Remelin, G. S. Gulachaus, Brendamour Sporting Goods Company, Wayne Oil Tank & Pump Company, Chadwick Agency, Waverley Electrical Garage, Paragoa Refining Company, Andrews Manufacturing Company, Perfection Lighting and Storage Battery Company.

Those showing commercial cars include: Citizens' Motor Car Company, Leyman-Buick Company, Cincinnati Motor Truck Company, O. Armleder Company, Robert C. Crowthers Automobile Company, United States Motor Truck Company, Hanauer Automobile Company, Ostholthoff & Braukmann, Dr. H. C. Wendell, Highland Body Company, Haberer & Company, Wayne Oil Tank & Pump Company, Miller Du Brul & Peters Manufacturing Company, Herold Reo Company, Fisher Auto & Service Company, Chicago Pneumatic Company, Schacht Motor Car Company, International Harvester Company, of America, Moore Oil Company, Acme Company, Kelly, Roth & Company.

Harwood-Barley Manufacturing Company, Indiana.
Lange Motor Truck Company, Lange, Chase and Dayton.
Mack Bros. Motor Car Company, Mack and Saurer.
Packers Motor Truck Company, Packers.
Pittsburgh Automobile Company, Commer.
Pittsburgh Machine Tool Company, Curtiss.
Schacht Motor Car Company of Pittsburgh, Schacht.
Speedwell Motor Car Company, Speedwell.
Union Motor Car Company, Penn "30."
Vellie Motor Vehicle Company, Vellie.
West Penn Auto Company, Kelly.

Accessories

Automatic Steam and Vulcanizer Company.
American Roller Bearing Company.
Arthur F. Kent Company.
Commercial Hardware Mfg. Company.
Diamond Metal Garage Company.
Doubleday-Hill Electric Company.
Duquesne Auto Parts Company.
Hoover & Hurst.
Iron City Spring Company.
Jackson Motor Supply Company.
John G. Higbee Glass Company.
Joseph Woodwell Company.
Miles Spring Wheel Company.
O'Neil Tire Protector Sales Company.
Penn Auto Specialty Company.
Perfection Auto Lighting Company.
Pittsburgh Auto Equipment Company.
Pittsburgh Auto Lamp Repair Company.
R. D. Nuttall Company.
S. & S. Shock Absorber Company.
The Britton Mfg. Company.
Union Auto Specialties Company.
Walker Shock Absorber Company.
Wayne Oil Tank Pump Company.
Williams & Company.
Winterton Manufacturing Company.
Portable Turn Table Company.
Pyrene Sales Company.

Two Shows at Minneapolis

Armory Has 73 Exhibits, While Auditorium is Housing 33

MINNEAPOLIS, MINN., Feb. 19—Two shows hold the public eye this week and the expected attendance is nearly 200,000. The fifth annual show of the Minneapolis Automobile Association is in the national guard Armory, with 60,000 square feet of floor space, and the first annual show of the Minneapolis Automobile Retail Dealers' Association is in the Auditorium, with 15,000 square feet of exhibition space. The latter show is from February 19-22, and the former opened Saturday night and will run to February 24.

At the Armory show there are fifty-four exhibitors on the main floor with 220 automobiles; thirty truck and tractor exhibits occupy the basement and in the balcony are twenty-five accessory exhibits. The lowest-priced car shown is at \$350 and the highest at \$10,000. Trucks range from \$495 to \$9,000. The estimated value of the exhibits is \$800,000. The exhibit of farm tractors is the first of the sort, and it is considered a remarkable one as it shows the growth of the popularity of the internal combustion engine as applied to farm use. The show was opened by Governor A. O. Eberhart and his staff.

At the Auditorium there are fifteen exhibitors of pleasure cars showing sixty exhibits, the cars ranging in price from \$650 to \$5,000. Two hundred exhibits are shown of accessories, and the estimated total value is \$200,000. Thirteen individual accessory firms are represented. At the two shows are to be a total of 1,500 individual outside dealers if the attendance continues to be as large as at the start.

Exhibitors of pleasure cars, trucks and tractors at the Armory show are as follows:

Deere & Webber Company, Velie.
Northwestern Automobile Company, Ford and Ford Truck.
Barclay Auto Company, Chalmers, Thomas, Paige-Detroit.
Bruce Automobile Company, Detroit.
J. I. Case Threshing Machine Company, Case.
Hudson-Thurber Company, Speedwell, Bergdoll.
F. E. Murphy Auto Company, Mitchell, Flanders Electric.
Pence Automobile Company, Buick, Stevens-Duryea.
Pence Automobile Company, Stearns-Knight.
United Motor Minneapolis Company, Maxwell, Columbia, Sampson Truck.
Louverne Automobile Company, Luverne.
Northwestern Overland Company, Overland, National.
Northwestern Overland Company, Overland Delivery Wagon.
H. E. Wilcox Motor Car Company, Wilcox, Wilcox Truck.
Anderson Electric Car Company, Detroit Electric.
Rauch & Lang Electric Car Company, Rauch & Lang Electric.
Northern Motor Sales Company, Lozier, Marion.
Studebaker Corporation, E. M. F., Flanders, Studebaker Electric.
Studebaker Corporation, Flanders Truck.
Tri-State Automobile Company, Inter-State.
Northwestern Cadillac Company, Cadillac.
Joy Brothers Motor Car Company, Packard, Packard Truck.
P. J. Downes & Company, Rambler, Gramm Truck.
R. C. H. Corporation, R. C. H., Hupp-Yeats Electric.
Fawkes Auto Company, Ohio Electric, Reo, Marmon, American.
Kemp Bros. Auto Company, Courier Clermont, Waverly Electric.
Kemp Bros. Auto Company, Brush Runabout, Haynes.
Locomobile Company of America, Locomobile, Locomobile Truck.
Locomobile Company of America, Locomobile Fire Truck.
John P. Snyder Company, Fiat, Lexington.
Regal Sales Company, Inc., Regal.
Westcott Motor Car Company, Westcott.
R. W. Munzer & Sons Company, Hupmobile.
Waldref-Odell Motor Car Company, Pierce-Arrow.
T. M. Anderson, Peerless.
Columbus Buggy Company, Columbus Electric, Firestone-Columbus.
Columbus Buggy Company, Kelly Motor Truck.
Winton Motor Carriage Company, Winton Six.
Minneapolis Steel & Machinery Company, Twin City (Tractor).
Robinson-Loomis Motor Truck Company, Detroit Motor Wagon.
Robinson-Loomis Motor Truck Company, Gopher Truck.
Gas Traction Company, Big Four (Tractor).
Avery Company, Avery Truck.
Chase Motor Truck Sales Company, Chase Motor Truck.
Eagle Motor Works, Metz.
Alma Manufacturing Company, Cameron Auto Truck.
Pioneer Tractor Mfg. Company, Pioneer (Tractor).
Genge Power Vehicle Company, Grabowsky Truck.

Exhibitors at the Auditorium show are as follows:

Haynes-Knutson Auto Company.
Robertson Motor Company.
A. F. Chase & Company.
MacArthur-Zollars-Thompson Company.
Northwestern Halladay Motor Car Company.
Jackson Motor Car Company.
Northland Motor Car Company.
Colby Motor Car Company.

Fifty-Two Exhibits at Omaha

Council Bluffs Dealers Are Included in the Showing This Year

OMAHA, NEB., Feb. 19—The Seventh Annual Omaha Automobile show, which opened at the Auditorium this evening is the largest motor car exhibition ever staged in this section of the country. There are fifty-two exhibitors showing 165 pleasure cars, a score of trucks and delivery wagons and automobile accessories.

The main floor is taken up with pleasure cars. Thirty-three dealers of Omaha and Council Bluffs are displaying 57 different makes of cars. On the stage five companies are exhibiting automobile supplies of all kinds. In the basement twelve dealers are displaying 14 makes of commercial cars.

Four Council Bluffs dealers are exhibiting. They have been barred out the last few years on account of lack of space, but this year room was made for them. The list follows:

Pleasure Cars

Apperson Auto Company, Apperson.
Bradley, Merriam & Smith, Imperial, McIntyre.
Cadillac Auto Company, Cadillac.
Cartecar Nebraska Company, Cartecar.
J. I. Case Threshing Machine Company, Case.
John Deere Plow Company, Velie.
Deright Auto Company, Locomobile, Stoddard-Dayton, Waverley Electric.
Electric Garage Company, Packard, Rauch-Lang, Baker, Flanders Electric.
Freeland Auto Company, Mason.
Ford Motor Company, Ford.
Fredrickson Auto Company, Pierce-Arrow, Chalmers.
W. L. Huffman Auto Company, Hupmobile, Abbott-Detroit, Hupp-Yeats Electric.
Interstate Auto Company, Inter-State.
R. R. Kimball, Stevens-Duryea, Stanley Steamer, Reo.
Lining Implement Company, R. C. H., Oakland.
Marsh Auto Company, Premier, E. M. F.
Mitchell Motor Company, Mitchell, Lozier.
Andrew Murphy & Son, Detroit Electric.
Marion Auto Company, Marion, Marmon, Ohio Electric.
Moline Auto Company, Moline.
Nebraska Buick Auto Company, Buick, Marquette.
T. G. Northwall, Brush, Detroit, Courier, Liberty-Brush.
Omaha Auburn Auto Company, Auburn.
Pioneer Implement Company, Jackson.
Rambler Motor Company, Rambler.
Guy L. Smith, Franklin, Hudson, Peerless.
Jack Sharp, Alco.
Studebaker Corporation, E. M. F., Flanders.
Traynor Auto Company, Cutting, National.
United Motor Omaha Company, Maxwell, Columbia.
Van Brunt Auto Company, Overland, Pope-Hartford, Ohio Electric.
E. R. Wilson Auto Company, Lexington, Paige-Detroit.
Wallace Auto Company, Stearns.

Commercial Exhibitors—Basement

John Deere Plow Company, Velie.
Deright Auto Company, White.
Drummond Motor Company, Reliance (General Motors Company).
Electric Garage Company, Packard.
Freeland Auto Company, Mason.
International Harvester Company, International.
Johnson-Danforth Company, Avery.
Nebraska Buick Company, Buick.
Andrew Murphy & Son, Detroit Electric, Kelly.
T. G. Northwall, Brush, Afterbury.
Jack Sharp, Alco.
Studebaker Corporation, Flanders Delivery.

Accessory Exhibits, Stage

Baum Iron Company.
Omaha Rubber Company.
Powell Supply Company.
Storz Auto Supply Company.
Western Auto Supply Company.

*Council Bluffs exhibitors.

Minneapolis Hudson Auto Sales Company.
E. J. La Fontaine.
Ranger Auto Company.
Elmore Motor Car Company.
White Garage.
Yale Auto Company.
A. C. Thompson Carriage Company.
Crowe Motor Car Company.
Ira Enmark.
Nels Rosendahl.
A. R. Horn.
Dahl Punctureless Tire Company.
Van Tilburg Company.
Baker Demountable Rim Company.
Ignition Starter Company.
The American Starter & Carburetor Company.
The Acme Shop.
Terry Manufacturing Company.
Universal Manufacturing Company.
Dean Electric Company.
Stark Sporting Goods Company.
Speed Punctureless Tire Company.

Kentuckians Fight Bad Law

Urge Owners to Protest Against the Passage of Newcomb Bill

Annual Meeting of the Wisconsin A. A.—Detroit After National Dealers' Show

LOUISVILLE, KY., Feb. 18.—The Louisville Automobile Club and the Automobile Dealers' Association have combined in the fight against the Newcomb bill. Both organizations advocate the Knight automobile bill, which comes up in the House Tuesday, February 20 at 1 p.m. Cards have been sent out to all the automobile owners of Kentucky urging them to vote against the Newcomb bill and for the Knight bill. The objectionable sections of the Newcomb bill are as follows:

Section 15—In the event of any collision either head-on or from behind between "motor vehicles" and an animal-drawn vehicle, or of said "motor vehicle" knocking down or running over or colliding with any animal of any kind, nature or description the presumption of evidence shall be against and the burden of the proof of innocence upon the chauffeur, driver or operator of such "motor vehicle" or the owner or owners thereof, whether or not said owners occupied said "motor vehicle" at the time, in any criminal action or civil suit that may be brought and found, and in the event of a civil suit the damages sued for and awarded may be punitive as well as actual.

Section 16—For the violation of any of the provisions or sections of this act, the owner or owners of any "motor vehicle" or their agents or employees may be held liable whether they be present or not, and they may be proceeded against either criminally or civilly, or both, in the same manner as though they had been actually present and occupying said "motor vehicle" at the time of the offence or violation complained of.

Section 18—Any person or persons offending or violating the provisions of this act, as set forth and declared in section 15, may be proceeded against and prosecuted, either civilly or criminally, as is now provided for by law, except that the presumption of evidence against and the burden of proof shall be upon the offender and violator or offenders and violators and not upon the plaintiff or commonwealth.

Wisconsin A. A. Elects New Officers

MILWAUKEE, WIS.—William H. Raymond of Milwaukee was elected president of the Wisconsin State Automobile Association at the annual meeting of the board of directors in Milwaukee last week. A. P. Cheeck of Baraboo is the new vice-president; Dr. A. E. Rector of Appleton, second vice-president, and James T. Drought was re-elected secretary, as was George A. West, treasurer. The executive committee is: M. C. Moore, Milwaukee; James T. Drought, Wisconsin member of the A. A. executive committee; George A. West, A. F. Winter, Sheboygan, and W. D. James, Fort Atkinson. Mr. Moore was president for three years and now takes the position of state organizer. The executive committee will have charge of arrangements for the third annual Wisconsin reliability tour, to be held in July. The association has a membership of 1,600.

National Dealers' Show for Detroit

DETROIT, MICH., Feb. 19.—A movement to secure a national dealers' show for Detroit early in October, 1913, is receiving enthusiastic support. Fred Postal, the prominent hotel man and motor car manufacturer, who was formerly president of the Michigan State Agricultural Society, suggests that the show be held at the state fair grounds and be made an annual event.

Will Drive in French Event

Bruce-Brown and De Palma in Grand Prix with Benz and Mercedes

American Cars Form Bulk of the Displays at the Canadian Shows

CHICAGO, Feb. 19.—Even if no American car manufacturer outside of possibly the Ford participates in the French Grand Prix next summer, there will be at least two American drivers in the international classic—David Bruce-Brown, winner of the American Grand Prix, and Ralph de Palma. This information reached Chicago today in a letter addressed by Eddie Hearne to the Benz Company, which states that Bruce-Brown will drive his Savannah Fiat in the French Grand Prix and that de Palma will have the same Mercedes he drove at Savannah which, however, will have several improvements on it. Bruce-Brown, while he was in Germany, visited the Benz factory at Mannheim, where he was told the Benz Company would do nothing for him in the way of expenses.

The severing of relations between Hemery and the Benz company also is officially announced, the German makers stating that Hemery is to drive a De Dietrich in the French Grand Prix. They also claim that their former designer has gone with De Dietrich, and that he is engaged in the manufacture of an eight-cylinder car of 300 horsepower which will be turned over to Hemery for an attack on the world's straightaway records held by Burman. The latter at present is in Cuba, where he will participate in meets at Havana this month and next, after which it is understood that he intends going to Ormond for trials.

American Cars at Winnipeg Show

WINNIPEG, MAN., Feb. 12.—Winnipeg's second annual motor show was opened this afternoon by the Lieutenant-Governor of Manitoba, D. Cameron.

While not so representative as it might have been, owing to split in the trade ranks on the show question, it is still one of the most attractive exhibits of motor cars, motor boats, motorcycle and accessories ever seen in western Canada.

The cars that are exhibited include the Columbia, Maxwell, Paterson, Rambler, Kissel Kar, Michigan 40, Brush, White, Hudson 30, R. C. H., Alpena Flyer, Paige-Detroit and Clark 30.

Makers of Capital Electric in Trouble

WASHINGTON, D. C., Feb. 20.—The creditors of the Washington Motor Vehicle Company, with claims aggregating \$1,139, today filed a petition in the District Supreme Court asking that the concern be adjudged bankrupt, the allegation being made that the officers of the company admitted the company's insolvency on January 15 last. A rule returnable March 6 was issued by Chief Justice Clabaugh.

The creditors and their respective claims are: The Philadelphia Storage Battery Company, \$1,066.15; Williard A. Simonds, \$26.85; Williams & Company, \$46. The company makes the Capital electric car, in which a large number of Washington business men hold stock.

Ottawa's First Show a Success

OTTAWA, Feb. 17.—The first automobile show to take place in Ottawa closed tonight. It was a splendid success. The display included thirty-seven motor car exhibits and twenty-one accessory and motorcycle exhibits. The value of exhibits were \$750,000.

Using Kerosene for the Automobile Motor

Description of a Novel Coal Oil Gas Producer for the Car

KEROSENE is such a desirable fuel that many automobile engineers have attempted to adapt the automobile engine to its use. The cheapness of kerosene is a specially tempting factor, but there is great difficulty in vaporizing the kerosene to a sufficient degree to permit of its use in an automobile motor. The system described below is a sort of atomizing and preheating apparatus through which the kerosene is conducted on its way to the motor. As gasoline is necessary for starting the engine and warming it to a certain degree, the gasoline tank cannot be done away with, but is reduced in size; but the use of kerosene instead of gasoline at almost all times reduces the fuel bill very materially.

The usefulness of the device is proportional to the saving effected by it and inversely to the added equipment. Another very important point, which can be settled upon only by continued experience, is its reliability. If the system can be depended upon in the same measure as the gasoline system, it will readily be placed on the cars of many automobilists; whereas, if it should fail to equal that system in reliability, this would materially reduce the advantages offered by reduced cost of operation.

This device has been developed by the Kerosene Gas Producer Company, of 1926 Broadway, New York. It may be attached to any gasoline engine of standard make, either marine, stationary or automobile, without alteration, and thus convert the engine to the use of kerosene instead of gasoline, or it may be run on either at will. The manufacturer claims a material increase in efficiency on kerosene, varying from 10 to 25 per cent.

The kerosene gas producer may be called a suction gas producer. It is cylindrical in shape, closely resembling the ordinary muffler. Its length varies from 11 1-2 inches to 26 inches over all and its diameter from 5 inches to 8 inches on various horsepowers from 2 1-2 to 100. The weight is hardly to be considered, as this varies from 20 pounds to 50 pounds complete for the above-mentioned horsepowers.

The producer should be attached to the exhaust manifold of the engine in the same manner as a muffler, and as close to the cylinders as the construction of the engine will allow, but does not take the place of the muffler, as this also should be used, but it is by no means absolutely necessary to the operation of the producer.

The kerosene is vaporized by passing through a specially designed mixing valve, which is mounted on the under side of the producer on the end farthest from the engine. This vapor is then drawn by the suction of the engine through a tortuous pas-

sage of about 20 feet in length contained within the producer, the thin walls of which are surrounded by the hot exhaust or waste gases, which heat up the vapor to a point where it becomes a gas, and is then drawn through a flexible steel tube to the gasoline carbureter, where about four parts of air are added to the mixture, which is drawn in through the auxiliary air inlet of the gasoline carbureter and thence to the intake valves of the engine.

The operation of the producer is as follows: The engine is started in the ordinary way on gasoline, and after running from 3 to 5 minutes the kerosene is turned on and the gasoline turned off. In the hand control the proper time in which to change over is indicated by a dial thermometer on the producer. In the automatic type the shifting of the fuel and the regulation of heat are controlled by a thermostat, which also governs the temperature of the gas entering the cylinders, thus maintaining perfect control of the engine under all conditions of speed or load.

Should the engine stop for a sufficient length of time to cool off below the point of gasification, it will automatically shift back to gasoline, so that the operator can crank his motor at any time with full confidence that it is on the proper fuel to start.

The producer should be connected to the exhaust port as closely as the construction of the engine will permit, avoiding elbows or turns if possible, the end of the producer having the heat damper, being nearest the engine and the kerosene atomizer furthest away. Connect the kerosene supply to the atomizer. One end of the flexible steel tubing should be fastened to the carbureter. The type of gasoline carbureter best adapted for the use of kerosene is one having a permanent air opening of small area and the usual type of auxiliary air inlet. The flexible steel tubing should be connected to the permanent air opening, or the permanent air opening should be closed and the flexible steel tubing connected between the auxiliary air inlet and the throttle valve.

The accompanying illustrations illustrate clearly the system of installing the Universal producer on an automobile motor. Fig. 1 is an end view of the whole scheme, and Fig. 2 a side view. The main portion, the kerosene producer, is depicted in Fig. 3, which indicates its compact design. The simplicity of the entire system is well illustrated in Fig. 2, and it seems that anyone could install the apparatus on a car within a very short time, since there is only a small number of connections necessary for arranging and fastening the various parts in their proper positions.

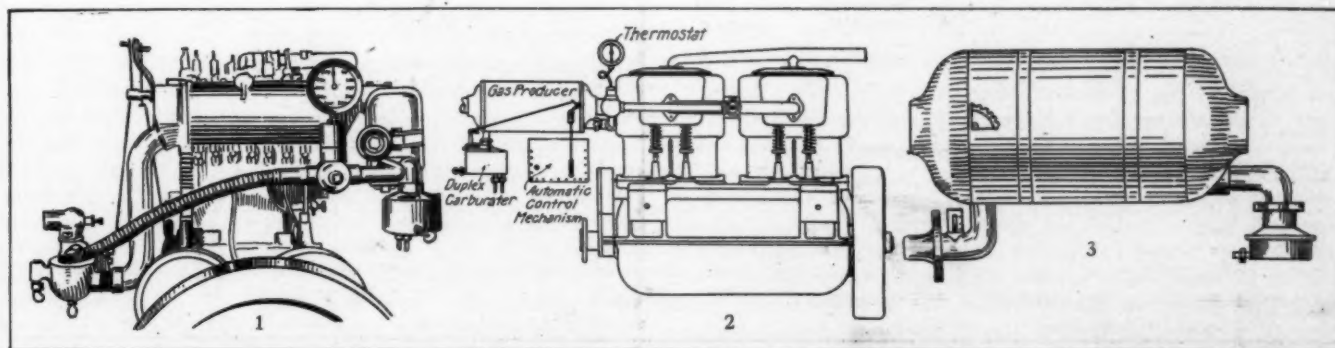


Fig. 1—End view of engine adapted for kerosene. Fig. 2—Automatic gas producer scheme. Fig. 3—Universal kerosene producer

Reducing the Expense of Demonstrating

To Avoid Excessive Depreciation and Regulate Fuel Consumption Systematic Control of the Movements of the Automobile Is Necessary, and a Method of Obtaining This End Is Illustrated Herewith

THERE are, at the present time, two methods of selling the automobiles made in a factory. One is that of closing agencies with a number of men who handle the product of the factory in their respective territories and who serve as middlemen between producer and consumer. The agent taking on a car and selling it for the list price fixed by the maker derives his profit from the discount granted to him by the manufacturer. The second manner of selling automobiles is through selling branches which are under direct control of the manufacturing concern. The profit of the sales establishment in this case is not as high as the discount of an agent selling the same number of cars, but this difference is balanced by the fact that the branch is part of the organization itself and therefore not entirely dependent on the sales made by it.

Without attempting to decide as to the more advantageous process of the two, it may be stated that the wealthier concerns seem to prefer the use of selling branches, especially in large cities. Smaller companies make use of the agency idea in territories of all grades of importance, and this fact is indicative of the lower cost of this system.

Demonstrating Car Often Costly

IF the Automobile Row of New York City is surveyed, it may be seen that the furnishing of the selling branches is decidedly more luxurious, with a few exceptions, than that of the agencies. Should the reason be that the individuals bearing the ultimate cost of this equipment are far and away? Not entirely. It must not be forgotten that the more expensive and splendid an automobile is, the more luxurious a setting does it require to be displayed to the best advantage. But the fact remains that luxury is always accompanied by wastes of varied nature, and the elimination of such wastes is a problem worthy of the most serious attention of the manufacturer and the head of the selling branch. They are both desirous of reducing the cost of operation of the branch in some manner in order to reap a higher profit.

Attention has been called a number of times to the abuse of the demonstrating car. There are a number of selling branches in New York which place a demonstrating car at the command of each salesman, who uses it in calling upon the prospective

customers and in showing them the virtues of the product. As a matter of fact, the demonstrating car constitutes quite an item in the selling expenses of such establishments as above mentioned, because it consumes not only a noteworthy quantity of fuel and lubricants, but the depreciation of the automobile is proportional to the use to which it is put. A salesman who needs must demonstrate the virtues of his wares to the customer by rushing hills, hitting up high speed and by similar stunts will finally come to enjoy this sort of sport and indulge in it to satisfy his own desire. Needless to say, this can but shorten the life of the demonstrating car. Likewise not a few salesmen, after a day's hard work, make use of the car, sometimes to call on prospectives, but frequently enough to take a ride with some friends, *amis et amies*, which again puts the machine to useless work and increases depreciation.

At this time, when all expenses in the business are tremendous, something must be done to eliminate this costly and fruitless abuse. It is here that a well-designed system may be introduced to great advantage. But it is proposed to exert great care in the application of such a system so as not to exaggerate its use and thereby injure the business of the company. A salesman must have the use of the machine when he actually works for the company, but not at other times. But the head of the establishment, if he understands the business, will be capable of judging where wasteful use of a car sets in if he is kept informed how often it was used to bring a salesman to a prospective's domicile or to demonstrate its operation to the possible purchaser.

The system here proposed embodies the use of three cards shown in the accompanying illustrations.

The first card, Fig. 2, bears the name of the company, the number of the demonstrating car it refers to and the date on which it is filled out. This type of card is made out daily for each demonstrating machine and filed under the car number with the dates in rotation. The use of individual cars by all salesmen is preferable to the method of having each salesman pick out any one demonstrating car, because, if one salesman does not treat his car as he should, he will ruin but that one car; whereas if he takes his turn on all the machines the total depreciation will amount to a much larger loss.

Fig. 3 is the record of car No. 4, used by Tom Jones for

Company		Demon. Car No.		Month		Year																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals	
Miles.....																																		
Gasoline, gal....																																		
Hours.....																																		
Salesman.....																																		
Storage \$.....		Repairs \$.....		Insurance \$.....		Lubricants \$.....																												

Fig. 1—Monthly record of demonstrating car, giving all details of its performance during that period

selling and demonstrating work on January 10. The car made 62 miles that day, as Jones called on four prospective customers. The first was E. D. Barney, whom he visited at his office and took out for a short demonstration of 15 miles. The running time of the automobile on this customer's account amounted to 57 minutes. After taking his leave, without having closed the deal, the salesman called on Dr. N. Farrar at his uptown home, and after some conversation he took him also out on a demonstration. This demonstration ride was 10.5 miles long, and lasted about 30 minutes, as the physician wanted to use his car for speedy travel. Including the demonstration and the ride to and from the prospective's home, the automobile traveled 41 minutes, according to the note made by the salesman.

After lunch Jones went to call on J. T. Wells to cultivate another hopeful acquaintance of his. This trip led him about 3 miles uptown, and, in addition to this, he gave a demonstration of 11 miles. On his way back to the store he dropped in at K. McL. Banks, talked and gave a demonstration of 13.5 miles. Thus out of 62 miles' travel 50 miles amounted to actual demonstration work, while the total travel of 62 miles was made in 3 hours, 10 minutes. For this work 3 7-8 gallons of gasoline were used, as the salesman had started out with 5 gallons of fuel in his tank and on his return had only 1 1-8 gallons.

Any man will be content to take his hands off the steering wheel after having driven 62 miles in a day. Chances are that after that much work done few salesmen will desire a joy ride. The day's work as recorded on the card, Fig. 2, was a hard job, and four-fifths of the ride was made for purely demon-

Company Jan. 10, 1912 Car No. 4					
Salesman	Prospective	Miles	Gasoline		Running Hours
			Start	Finish	
Tom Jones	E. D. Barney	19 (15)	5 gals.		:57
	Dr. N. Farrar	12.5 (10.5)			:41
	J. T. Wells	14 (11)			:42
	K. McL. Banks	16.5 (13.5)		1 1/8 gal.	:49
		62 (50)	Used	3 7/8 gal.	3:10

Fig. 2—Salesman's daily record card

stration purposes, namely, 50 out of 62 miles. Now suppose that instead of 62 miles the salesman had covered only 32 miles for demonstration work and had taken out the car for his personal use later on. If the system used in his establishment called only for a weekly and unitemized record, he could have charged 62 miles for that day, yet might have devoted 30 miles to his own purposes. It would not have made any difference in the final account, but the machine would have undergone 50 per cent. of its depreciation without any possible profit to the business of the company. Under a fast and loose system a salesman may easily enjoy a 20-mile joy ride each average day, amounting to 600 miles per month, or 7,200 miles per year. It will not be the fault of the company if he does not avail himself of the opportunity; but if the salesman's free rides only amount to 5,000 miles a year, figuring 10 miles to the gallon of gasoline, this gives a fuel consumption of about 500 gallons. While the price of this wasted fuel is only \$55, the depreciation of the car under the work is very considerable; nor does it matter whether the depreciation incurred by 5,000 miles' travel is distributed over two or three cars, since the loss resulting from it remains the same. The selling value of the car decreases in proportion to the work it does before the sale.

The demonstrator car should be equipped with a daily trip-meter installed in a location invisible to prospectives, set at zero when the salesman takes out the car in the morning and

Co. Salesman Tom Jones					
Car No.	Date	Hours	Prospective	Miles	Gasoline
4	1/10	3 10	E. D. Barney Dr. N. Farrar J. T. Wells K. McL. Banks	62	3 7/8

Fig. 3—Record of demonstrating car

read when he turns it in at the close of the day. During the time he uses the car the trip-meter casing should be locked, and, after the day's travel having been read, reset to zero for the next trip of the salesman. The daily trip indicated by the locked recorder must check with the record card filled out by the salesman, using for the purpose the readings of the ordinary odometer. Fig. 3 contains the same information as Fig. 2, but is filed under the salesman's name and serves as a check on Fig. 2. Another card, not illustrated here, may be used to show the number of calls and length of demonstrations made to each prospective, as well as the dates of salesman's calls, but a final record on the performance of each demonstrating car is seen in Fig. 1, which is a detailed monthly report.

There is no doubt that by the use of this system, if it is enforced conscientiously, the cost of demonstrations may be reduced at least one-third. This means that the depreciation of the automobile in demonstration work may surely be reduced in that measure, while the fuel consumption will be probably decreased even more. The use of the system takes at most 2 hours of a clerk's time, or 66 cents a day if the clerk is paid \$15 a week and works 45 hours a week.

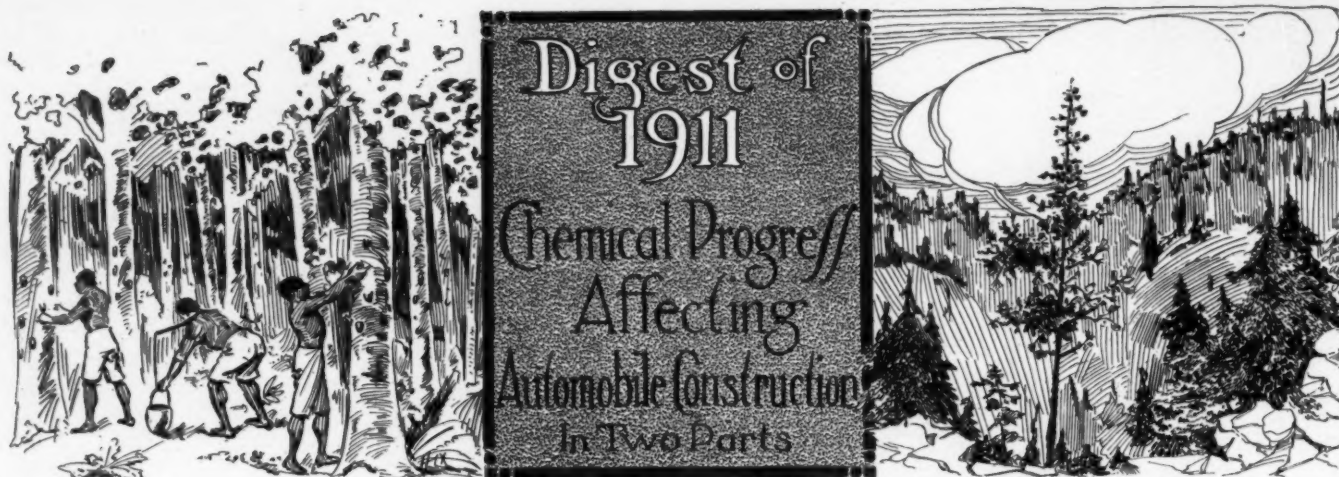
Record System Decreases Expense

THOUGH there are not many cases where a salesman uses his car as much as 20 miles a day for his private enjoyment it will be shown, by following up this extreme, how great a loss is sustained in this way by the manufacturer and dealer. Suppose the machine handled by the company sells for \$2,500. It may well be said that the car depreciates at the rate of 30 per cent. per year. This would mean \$750 depreciation a year for each demonstrating car that is used through 12 months; but as no car serves as long as that the depreciation is distributed over two or three cars.

Now suppose that, in addition to the normal hard work of the demonstrating car, the salesman takes free rides aggregating 5,000 miles a year. No doubt this would increase the rate of depreciation by, say, one-fourth, so that in addition to \$750 the sum of \$187.50 has to be deducted from the value of the car after the year is over. Add to this sum the cost of gasoline, \$55, and of lubricants, say, \$7.50, then the cost of the salesman's joy-rides may easily be found:

Depreciation	\$187.50
Cost of fuel	55.00
Cost of oil, etc.	7.50
Total	\$250.00

Large concerns in the metropolis frequently use three or four demonstrating machines. If four machines are abused to the extent outlined above, the consequent loss is \$1,000. In fact, the loss is considerably in excess of this figure, because this takes in neither the repairs necessitated by the excessive use, nor the cost of trivial accidents which are bound to happen from time to time. But, adhering to the sum of \$1,000, we will see how the system described above reduces this expense by doing away with it. The system costs 66 cents a day, or \$206.58 a year; deducting this from \$1,000, \$793.42 is found to be the yearly saving effected by the use of this system.



Part I

Tires from Turpentine—Maybe from Tar

MANY chemical inventions of the past year relate to the synthetic production of substitutes for natural rubber; to new unflammable materials intended to take the place of the ordinary celluloid produced from cellulose nitrate—to avoid its fire risk—and to the utilization of gelatine or casein for producing strong and plastic materials which are neither too easily ignited nor hygroscopic, as fiber, and therefore not subject to deformation from the absorption of moisture. A few of the inventions relate to enamels, paints and colorings for metals.

An artificial rubber to take up the competition, as regards quality as well as price, with the products of the forests and of the fast increasing number of rubber tree plantations, is looked upon as the guarantee of continued expansion to which the tire industry must look for protection against more radical changes in tire construction; while strong plastic materials susceptible of all desirable variations in shapes, hardness, gloss and colorings are strongly indicated for automobile body and panel work, as well as for aeroplanes.

Metallurgical inventions, while not numerous and either not fully developed or kept secret, seem to tend toward the use of certain salts and carbonates of tungsten, chromium, titanium and vanadium for transforming articles which have been forged or machined in soft steel or wrought iron into alloy steel of high quality by means of a cementation process similar to that used for case-hardening. But reliable details on these processes and their results are still lacking.

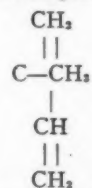
Artificial Rubber Possible

PERHAPS the strongest impulse toward a reduction of rubber prices during the past year was received when the Farben fabriken, of Elberfeld, Germany, announced positively that the problem of producing artificial rubber had been technically solved. Friedrich Bayer, of this concern, had, years ago, made a similar announcement with regard to indigo, and while many years had elapsed and large sums of money had been spent before his technical discovery resulted in commercial profits for his house in this line, and while indeed artificial indigo is still said to be far from equal to the dye derived from the indigo tree, it was well remembered that nevertheless the industry which had flourished on the basis of indigo tree culture had languished in proportion as the artificial product had invaded the markets, an almost imperceptible price shading being sufficient to command this result. It was the same man who stood

back of the new statement with regard to rubber. And at the same time the reports from rubber tree plantations became threatening. It had been given out previously that the plantation product was inferior in quality, but at the beginning of 1911 the reports of successful plantations grew too numerous to be denied, and the very number of them became alarming and convincing.

The apparent simplicity of the patent according to the Farbenfabriken was also stunning. The summary of the French patent, No. 419,316, comprises only two short paragraphs, as follows: 1. A process for producing a substance resembling natural rubber, consisting in the heating of isoprene with or without the addition of neutral, alkaline or acid agents; and 2. The new product and its employment in the industries.

The explanation given is also brief. With regard to the isoprene, which is derived from turpentine, its formula is given as



from which it will be seen that it is an organic substance which might be assumed to be subject to polymerization, this being the term implying a rearrangement of the molecules with a change in the atomic weights; practically a condensation resulting in a new or allotropic form of the same substance, the allotropic form being in this case rubber.

It is stated that if earlier experimenters, such as Wallach and Bouchardet, failed to get rubber from isoprene, the reason may have been the impurity of the isoprene which they used.

Three examples of suitable proceedings are given:

1—Heat in an autoclave (closed vessel with pressure valve) for 10 to 12 hours 200 parts of isoprene at 200 degrees C. There is then formed a very tenacious and elastic substance, which however is still sticky. It is treated with steam and loses thereby its viscosity, becoming transformed into a material resembling natural rubber.

2—Heat for 6 days 500 parts of isoprene in an autoclave at 90 degrees to 100 degrees C. Introduce steam in the viscous mass, at first at the ordinary pressure (of the autoclave) until all unchanged isoprene is expelled. The distillation by steam is then continued under reduced pressure until no more oil sep-

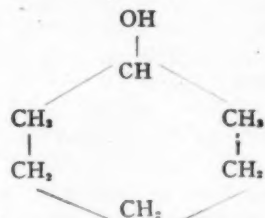
arates from the mass. After cooling there remains in the still a purely white rubber of excellent quality.

3.—Dissolve 100 parts of isoprene in 200 parts of benzine and heat the solution in an autoclave for 2 days at 120 degrees. By distilling away the isoprene which remains unattacked and liquid, benzine and terpene separate from the mass, and there remains a tenacious and transparent substance which by washing in alcohol loses its transparency and takes on the appearance of rubber.

Whatever mystery there may be to the layman in these processes evidently relates mostly to the isoprene. How is this substance obtained from turpentine? The method employed by the Farbenfabriken for this purpose is explained in this concern's earlier patent, No. 414,382 of April 1, 1910, corresponding to a German patent dated April 8, 1908. According to this, turpentine or any similar oil is first transformed into salts of polyvalent bases by means of complete alcoholization, and these salts are transformed into quaternary ammonium bases which are decomposed by heat or other means; and a large residuum, which is isoprene, is the result.

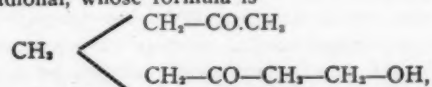
Only the few whose lifework lies with the entanglements of the carbon atom in organic substances and whose work-results consist in finding the thin but consistent thread of Nature's reasoning which runs through them are able to appreciate fully the facts and processes which lie behind the intricate chemical terms and formulas, but the automobile engineer with only a cursory knowledge of the principles of chemistry, and in fact the well-informed layman, will be able to extract from this account a general idea of the work which is going on among the experts of organic chemistry, despite the unavoidable use of terms whose full meaning can only be guessed, and to which in some instances there are no well established equivalents in the different languages.

Isoprene is a methyldivinyl, while erythrin is a divinyl (sometimes called a pyrrolylene in English), and the Farbenfabriken (formerly Friedr. Bayer & Company), soon found that rubber could be produced from the erythrin as well as from the isoprene. Consequently this concern presented a new patent in the course of 1911. This is No. 425,967 in France. According to this, the cyclohexanol



or any of its derivatives, is heated above 500 degrees C. It is poured dropwise into an iron tube heated to 600 degrees C. Decomposition takes place at once with a lively generation of gas, which is condensed directly or absorbed in bromin. This gives erythrin with high efficiency. Isoprene is obtained similarly by starting with orthomethyl-cyclohexanol or oxymethyl-cyclohexanol.

And a little earlier the Farbentfabriken, whose work is leading though perhaps after all not that which will count most decisively in the industry, had devised two entirely new substances, which probably are derived from a source entirely different from turpentine and yet with rubber production in view. These are octadecyl, whose formula is



and octenedione, obtained from the octadional by vacuum distillation on KHSO_4 or by heating with acetic anhydride.

Furthermore, in French patent No. 422,955, published in April, 1911, the Farbenfabriken gives eight recipes for getting rubber from other bases than erythrin or isoprene. Others had been busy, and there was need of covering the ground.

Not all the inventors go into the subject as deeply as the Farbenfabriken. Patent No. 419,786 is issued to A. R. Vanderburg, who declares that his product is especially adapted for inner tubes of automobile tires. He takes 100 parts of Chinese or Japanese wood oil (which seems to be derived from *dipterocarpus turbinatus*, a species of turpentine tree) and mixes it with 15 parts of resin oil. By heating this mixture at 260 degrees—one-half hour usually sufficing—it forms a plastic substance which, when cooled under cover, has the elasticity of rubber. The proportions of the ingredients may be varied. By using more resin oil than 15 per cent. a softer substance is obtained. The product is not claimed to be a chemical counterpart of natural rubber and loses its elasticity at a heat above 200 degrees C. and also at very low temperatures.

At the same time—the reports being published in February—François Paulet procured patent No. 419,281 for adding iodine to the usual rubber mixtures before coloring matter is added, thereby rendering it possible to obtain any desired and permanent color effect, as mentioned in a previous issue of THE AUTOMOBILE. Previously some of the colors interfered with vulcanization.

Rubber Direct from Turpentine

A TREMENDOUS advance step is recorded in the patent No. 419,860 to Georges Reynaud, which was published in *Chimie Industrielle* for April. He works with turpentine direct and converts nearly all of it into real rubber, while the others make isoprene from it first and then gain the rubber from the isoprene with a waste which, for some of them, runs up to 75 per cent. The Reynaud method is described as very economical. It consists in subjecting turpentine, or any similar oil (this phrase guarding against the doubts which might arise by reason of the great multiplicity of turpentines which are in the market), first to the action of diluted sulfuric acid and subsequently to sulfuric acid of greater strength, and then treating the substance so obtained with boiling hydrochloric acid. In order to obtain a uniform and complete transformation of the whole mass of turpentine, this is preferably first subdivided and comminuted by submerging an absorbent material in it, and real natural rubber is the material used in the original starting of the operation. It is cut into sheets or flakes. Subsequently, however, the rubber derived from the process itself is used for this purpose. Usually 1 kilogram of dry rubber will absorb 3 kilograms of turpentine. This whole mass is macerated in a bath of sulfuric acid of 53 degree Baumé, diluted with 1-4 to 1-3 part of water, the process taking 12, 18 or 24 hours, according to the thickness of the mass. When completely impregnated, the mass is placed in sulfuric acid of 53 degree Baumé (without dilution) for a few hours. Under the action of the acid, the turpentine is transformed into an elastic, doughy material, slightly sticky. Washing in running water removes the excess of sulfuric acid. This material may be used industrially, but it is perfected by first resting for some hours in concentrated hydrochloric acid, whereafter some water is added and the whole is boiled for some hours. The resulting product, when vigorously washed with ordinary water or water with an alkaline admixture (soda), is stated to be in all respects the same as natural rubber.

Although the method of Reynaud would seem to render superfluous any improved process for isolating isoprene from turpentine, the other investigators working concurrently on the same problem are unaware of his accomplishment or distrust it, and patent No. 423,112 to Herman Charles Woltereck, registered in May, is concerned with improved efficiency in the production of isoprene. Tilden had obtained 250 cubic centimeters of isoprene from 4 liters of turpentine by passing the vapor of this oil through an iron tube heated to a dull red and separating the isoprene from the precipitated liquid by repeated fractional distillations. Woltereck has now found that he can get much more isoprene by filling the iron tube with iron shavings or perforated disks—so as to compel a more subdivided contact of the

vapors with the heated metal—and by regulating the temperature strictly to 550 degrees C., and he devises a further improvement by mixing the turpentine vapors with a neutral gas, nitrogen preferred. In the subsequent fractional distillation of the precipitate, the portion parting between 34 degrees and 45 degrees is the isoprene, while the by-products are benzol and combustible gas.

Among patents issued at about the same time and relating to rubber, No. 423,133 to Gabet and No. 423,489 to Vanderlinde deal with the reclaiming of rubber from worn-out and more or less vulcanized articles, while Damian & Porteret, No. 422,527, have a process—apparently only speculative—for rendering rubber anti-skidding and more durable by mixing it with powder of carborundum, emery or similar very hard substances. And the Intercontinental Rubber Company, of the United States of America, in No. 424,795, describes a factory plant for the mechanical extraction of rubber from the secondary rubber-yielding plants and trees which do not give it up as a thin latex or sap.

Badische Anilin und Soda Fabrik, the great competitor of the Farbenfabriken, registers in patent No. 425,885 a variation in methods for extracting isoprene from turpentine. The vapor is heated to a high temperature (which the others shun) for a short time (longer exposure at the high heat would produce foreign gases) by means of an incandescent platinum wire, and the vapor is rarefied, preferably by adding neutral gases such as nitrogen.

Debange at about the same time perfects a process, No. 426,457, for purifying and reclaiming rubber by osmosis—which is the same action by which the saps are sent from cell to cell in a growing plant or body. Schleiffer, No. 427,173, has devised a process for separating resins from various grades of rubber which contain them, thus aiming to increase the available supply of first-class rubber by refinement of the inferior grades which may be had in large quantity.

Now comes, however, a sensational innovation.

Rubber by Bacterial Action

IF William M. Callender, of England, knows whereof he talks, bacteria and incubators are to be the instrumentalities through which coal tar and almost any other substance containing carbon and hydrogen in unstable combinations will be transformed into the principal ingredient in automobile tires of the future. Patent No. 427,912 gives the details. He produces first a rubber yeast. The term is fetching. And the remarkable transformations effected in other fields by bacterial action, as, for example, in sewage and in the soil of wheat fields, have well prepared the scientific world for accepting the possibility which Callender has worked into an accomplished fact, if everything is as he says. This liquid rubber yeast he produces from natural rubber latex (the exuded sap) by subjecting it to the action of an ordinary proteolytic ferment acting in an alkaline or neutral solution. The ferment is obtained from pineapple, though barley, grapes and many other plants might be used almost as well. He describes his best method as follows:

Thirty cubic centimeters of latex is mixed with 30 cubic centimeters of sterilized water, to which is added 5 cubic centimeters of a 5 per cent. solution of pineapple mash. This is kept three days at 35 degrees C. Then 30 cubic centimeters of glycerine, 135 of sterilized water and four of a 10 per cent. solution of bisulfate of ammonium are added. It is all placed in a baffle-plate retort, such as commonly used for washing gas, and a brisk current of oxygen is blown over it, while the liquid is maintained below 45 degrees C. After a while a flocculent, white precipitate is formed. The liquid, after filtering, is now dialized (a separation of the crystalline from the amorphous, colloid parts) or sufficient thiosulfate of sodium is added to convert the bisulfate of ammonium into sulfate of ammonium. Then it is concentrated in vacuum at a temperature not exceeding 45 degrees C., reducing its volume to 100 cubic centimeters. This is cooled to 0 degree C., and mixed with three

times its volume of absolute alcohol, also at 0 degree. After resting on ice for several hours, a flocculent substance is precipitated which contains the yeast. This is filtered, washed and brought into emulsion with 100 cubic centimeters of benzine, or other solvent of rubber, which may be pure but should preferably contain 5 per cent of naturally coagulated rubber.

The yeast is capable of producing rubber, or "something resembling rubber very strongly," by its action upon a large variety of substances, such as resins, turpentine and tar. In order to produce such rubber from coal tar, the latter is thinned by heat or solvents, is filtered to remove solid particles and is freed from its ammonia; then it is poured into troughs and the solution of rubber yeast in benzine is spread on the surface of the tar.

The troughs are now placed in an incubator where the temperature is kept at 45 degrees C., and a mild stream of oxygen is played over the surfaces. After a period averaging ten days, the contents of the troughs are poured into about three times their volume of wood alcohol and shaken strongly. And now the rubber separates in the form of blocks, and these are compressed to remove alcohol or other liquids.

Other Independent Efforts

SOME of the other finds in the search for rubber are mainly of interest in showing how the different investigators reach results by methods singularly similar in some respects and singularly varying at other points—thus foreshadowing an eventual simplification for all. Thus Oswald Silberrad, No. 426,007, published in November, has found that isoprene is best obtained by passing turpentine vapor over a large surface of continuous metal in a tube heated to 450 degrees to 750 degrees and under conditions causing the vapor to be much rarefied by reduced atmospheric pressure, and he gets in this manner up to 50 per cent. of isoprene from the turpentine, while, he says, previous methods have given only 2 per cent. to 5 per cent. Evidently he is behind his day.

Arthur Heinemann, No. 430,658, December, is orthodox in this new work in that he converts the isoprene into rubber by rearrangement (polymerization) of its molecules. But he employs oxygen, nascent oxygen or ozone for a preliminary treatment of the isoprene and then heats this treated substance.

Perhaps he has been inspired by Nature's method for converting blood serum into tissue.

Twenty liters of oxygen is used for 1 of isoprene, which is preferably first cooled, and the oxidizing treatment is continued for 6 hours. Then the product is heated in a closed vessel at a temperature varying from 40 degrees to 105 degrees C. The isoprene may be mixed with a neutral liquid, as benzine. (They have now all realized the value of subdivision by this means.) Portions found unconverted after cooling are evaporated, or the rubber is precipitated by means of alcohol. If time is no object, the rubber will finally be produced from the oxidized isoprene even without heat. And this is the important point in his research. If nascent oxygen is to be used instead of oxygen, peroxide of barium and diluted sulfuric acid may, to this end, be added to the isoprene; the acid only in sufficient quantity to liberate the oxygen. Heinemann also has a method for producing the isoprene, set forth in No. 430,657.

A new source of isoprene is found by W. H. Perkins, Charles Weizmann, F. E. Matthews and Edward H. Strange, all of England. According to their patent No. 427,286 and the English application which was dated March 9, 1910, they produce the isoprene from any one of four amylic alcohols (best known as a part of fusel oil), and they get the amylic alcohol from isopentane (a petroleum distillate) by first changing it into an amylene, as may be done by adding chlorinated zinc and heating. The amylene is then treated so as to lose two atoms of hydrogen, and the residue is isoprene. Heat will do this, or the amylene may be treated with bromine or chlorine.

In quite a different and less ambitious class is the rubber substitute devised by Frederick Tolken, No. 429,507, which is meant

as a filling for tire casings, taking the place of air. Tolkien uses 180 parts of a 37-degree Baumé solution of chloride of calcium, 55 parts of a 49-degree Baumé solution of chlorinated zinc, 10 parts of a 42-degree Baumé solution of nitrate of calcium, 20 parts of glycerine, 20 parts of formaldehyde of 40 degrees (same as commercial formalin) and 250 parts of flour. By the addition of more flour the composition gets more body. The chlorides, nitrate of calcium, formalin and glycerine are first mixed, cold; and then the flour is stirred into it. The compound must at once, when mixed, be injected into the form which it is intended to fill, where it then solidifies into an elastic mass.

The soya bean, whose importance in the domestic economy of the Orient has attracted wide attention among chemists of late, supplies the base for a rubber substitute discovered by Fritz Gossel and Arthur Sauer, No. 430,183, and they say it is superior to the substance extracted by a process similar to theirs from rape seed. The soya product can be rolled and vulcanized and does not lose its elasticity at high temperatures. It can be produced by a treatment of the concentrated oil of the soya bean with nitric acid, but another method, in which chlorinated sulfur is added and the mixture is heated to 190 degree C., is also available. The details are of minor interest in comparison with the more radical and thorough inventions by which the oil of the soya bean, among other oils, may be transformed into real rubber. The soya oil, however, also serves for the production of a linoleum which, it is stated by the inventors, is superior to any made from linseed oil.

Some Minor Improvements Made

A CONNECTING link between artificial rubber and the new substitutes for celluloid, as well as the new plastic materials formed on an albumin base, is brought to light by Julius Stockhausen, of Germany, in French patent No. 428,468, published in August. He gives several recipes, among which are the following: Dissolve 125 grams of powdered gelatine in 125 grams of raw glycerine of 28 degree Baumé at 70 degrees C. Add 15 grams of vegetable tar and 20 grams of camphor, or any of the camphor substitutes, dissolved in 10 grams of acetone. Harden with 15 grams of 4 per cent. formaldehyde. If this artificial rubber is to be vulcanized, 30 grams of sulfur is added before the formaldehyde. The substance is improved by passing it between rollers.

Toward the end of the year some minor improvements in rubber work are noticed. Walter, No. 429,138, records a method for vulcanizing limited areas of rubber. Rankin, No. 428,861, has a process for treating the latex of rubber trees and similar plants. Electrochemical Rubber Company, No. 430,232, deals with

the manufacture of rubber on metal, and Van der Kerkoff, No. 429,879, with a substitute for gutta percha.

A thorough search through the records of the year in all the principal countries would no doubt reveal a number of inventive efforts relating to the manufacture of artificial or synthetic rubber, which have not been mentioned in the foregoing, but it may be assumed that the most important omissions in this account are those relating to methods which are kept secret by the inventors or manufacturers.

Commercial Upshot of the Progress

COMMERCIALLY, the most important points in the situation, as this may now be seen in the light of the whole complex of inventions referred to in the foregoing, may perhaps be summarized as follows:

If the chemical factory can transform turpentine and even coal tar into first-class rubber, with economy, it should soon be possible to make first-class Para rubber out of the second-class African grades by some cheap treatment, thereby vastly enlarging the supply for the automobile tire industry. In point of fact, great progress has already been made in getting good rubber from suitable blending of different grades.

The rubber plantations should, on the same principle, even if the product cannot in all cases be equal to the rubber from the Brazilian forests, furnish a limitless supply of raw material competing with artificial as well as with Para rubber. The raw material for artificial rubber is, after all, derived from growing trees in the main, and, while the large variety of pines and larches from which turpentine may be obtained grow in widely scattered areas of the temperate zones of the earth, they are of slower growth than the rubber trees, and it seems to be mainly a question of organization, labor and freight rates whether turpentine in the long run can be produced cheaper than natural rubber latex. Most turpentine is even now adulterated, and the demand exceeds the supply.

If coal tar is considered as a probable source of rubber, it may be remembered at the same time that the demand for coal tar for purposes of road improvement, dyes and benzol draws heavily on the limited and scattered supply.

On the whole, the situation presages a steady increase in the supply of first-class raw material for the rubber and tire industry, warranting an extension of its activities, with steadily declining prices and probably with increased profits for all concerns capable of studying the situation as it develops from year to year and capable of taking technical advantage of this development to furnish an improved product to the consumer.

FROM *The Motor Review*, February 20, 1902:

Ralph L. Morgan, now general manager of the Toledo factory of the American Bicycle Company, plans to leave that place April 1 and take up the manufacture of steam trucks under the Thoryncroft patents at Worcester, Mass.

The International Motor Car Company is building a three-cylinder car with a tonneau body listing at \$1,800, which will be exhibited at Chicago next month.

A report has been industriously circulated that the Westinghouse Electric & Manufacturing Company, the Automobile & Cycle Parts Company and Studebaker Brothers have formed a combination to manufacture automobiles and that each company will furnish its specialty toward the assembly, which will be made in Pittsburgh. It is understood that the companies have been furnishing parts for the Studebaker product at South Bend, but otherwise the story lacks confirmation.

Work is almost completed on the new factory building of the E. R. Thomas Motor Car Company at Buffalo. The building is a two-story structure of pressed brick, stone and iron.

Harking Back a Decade

General Manager Windsor T. White, of the White Sewing Machine Company, of Cleveland, makes

the announcement that the new touring car model will be ready for delivery in 2 months.

When the Chicago show opens March 1 the Western public will be shown models of vehicles which in nearly every case will be the same as those seen in the East last November. The shows will be the same in every essential element. Why should the industry give the same display, once in November and the other in March? Why not have the Chicago show follow Madison Square Garden with only a week intervening? This would be a sensible plan, saving expense and much purposeless hurry. —Editorial.

George M. Barnes, vice-president of the Stearns Steam Carriage Company, of Syracuse, is confident that there will be no surplus motor vehicles in the hands of manufacturers at the end of the coming season. In speaking of the use of the car, Mr. Barnes emphasized the pleasures of skillful driving and said: "If all one had to do to drive a motor vehicle was to push a button there would be no pleasure in it."

Digest of the Leading Foreign Journals

Touching on a New French Spring Suspension, Prospective French Rubber Duty, Interurban Motor Stage, Spring Insurance, Etc.

AMANS Spring Suspension—Efforts at escaping the maintenance cost of pneumatic tires run either to elastic wheel construction or to new spring suspension methods, supposed to be more effective than the ordinary leaf-spring suspension, in its now numerous varieties. These proposed spring suspensions are, as a rule, designed to be used in conjunction with solid-rubber tires, sometimes under the impression that solid-rubber tires may be more cheaply maintained than those inflated with air; and, if this doubtful notion is not entertained, the security against interruption in the traffic which the solid tire affords, together with the possibility which always exists that some acceptable substitute for the solid-rubber tire may be devised, is looked upon as sufficient justification for the inventive effort. From out of the chaos of designs which have been offered the automobile industry, on this basis of ideas, it seems likely that in course of time something will be evolved which can be used, and the intermediate steps are to that extent of interest, even if each device proposed is still afflicted with some mechanical or commercial shortcomings, or offers only a partial solution of the problem. Recent European designs in this line of invention have in several instances involved the action of an L-lever whose long arm is secured to the wheel axle and whose short arm compresses or extends horizontal coil springs mounted on the vehicle frame. An example is shown in Fig. 1 representing the front of a low-priced 1912 runabout. In this class belongs also the Amans suspension, which was noticed at the recent automobile exhibition at Brussels, Belgium, and it is intended to be used in connection with a special solid-rubber tire. It is also intended to be used concurrently with an ordinary leaf-spring suspension, by which provision the designer circumvents the question of lateral rigidity (with some cushioning effect), which is troublesome in all efforts at devising substitutes for leaf springs. Under these circumstances, the first cost of the Amans suspension must be fully equal to, if not in excess of, that of ordinary equipment, including auxiliary shackle springs or shock absorbers, and, as the solid-rubber tires in the Amans system are intended to be

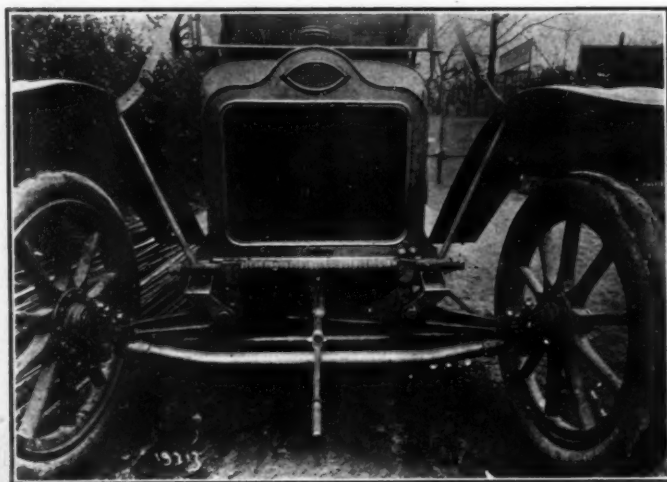


Fig. 1—Compensating spring suspension by L-lever action in low-priced 1912 French runabout

provided with anti-skid and anti-wear armors, while its cushioning efficiency is admitted to be inferior to the best that may be done with pneumatic tires, its commercial justification is to be sought for the present in whatever reduction of maintenance cost may be accomplished by its use, coupled with its security against punctures and blowouts; and it is claimed by its makers that its superiority from this point of view amounts to a saving of 80 per cent. on the average operating cost of pneumatic tires.

If this statement were to be fully credited it would amount to a discovery to the effect that the use of an anti-wear armor on a solid tire represents the most economical measure which can be adopted for reduced tire maintenance cost, and that consequently a solid tire, whose shape admits the strapping-on of such an armor, presents advantages which have been ignored in the past.

The accompanying illustration, Fig. 3, show the Amans construction. The auxiliary spring element is of the pneumatic order and comprises the two air cylinders G and G', in which the pistons F and F' act alternately as compressors, while the springs H and H' take the pistons back, if the air compression is insufficient. The air pressure is worked up to a predetermined maximum by the piston action when the vehicle first starts moving, the air inlet valves I ceasing to operate when the maximum has been reached. This provision obviates the need of extra-tight joints. The lever arms B and C with ball joint ends D and J, the grease gate M, the threaded rod L, whose length is adjustable, and the attachment K, by which the device is mounted upon the wheel axle or the leaf springs, are all features whose mode of operating is plainly indicated in the illustration.

In the tire the notable features are the shape and the method for securing it in the steel rim. The bottom of the tire is split along its middle line and the extensible retaining rod or wire T [it is not stated by what means it is made extensible or contractable.—Ed.] is located in the depth of the split when the tire is to be placed on the rim, this permitting the retaining edges of the tire to be passed into their place under the rim flanges. Then the extensible rod is drawn toward the rim by means of the screw bolts B, and in this position it exerts a considerable expansion pressure which, in conjunction with the hard vulcanizing of the edges, produces a secure fastening in which the strains are well distributed.—*La Vie Automobile*, January 13.

Proposed French Duty on Rubber—A bill has been introduced in the Chamber of Deputies in France providing for an import duty of 1 franc to 1.50 franc on every kilogram of raw rubber imported into that country, unless it comes from one of the French colonies, and it is the ostensible object of the bill to encourage rubber culture in the French Congo and Indo-China, which supply at present only 5 per cent. of the French rubber imports. The sponsors of the bill advance, among other arguments, the following:

The measure we propose should in our opinion meet with no objection. It cannot be said that an import duty of 1 franc to 1.50 franc on the raw material would involve an excessive sacrifice for the consumers of manufactured rubber articles, since last year raw rubber reached and passed a price of 80 francs per kilogram, and this price has since dropped, in so short a time, to 11 or 11.50 francs. Nobody should complain in France over having to pay 12.50 or 13 francs for a product for which he a few months ago paid three times as much.

The French automobile industry naturally takes a different

viewpoint and is preparing to fight the measure. It is admitted that the tax would bring the State from 8,000,000 to 12,000,000 francs of revenue, as the import of raw rubber amounts to about 8,000,000 kilograms, but it is not seen why this total should be saddled upon the owners of automobiles who are taxed in many different ways beforehand. Attention is called to the fact that the tax which was recently levied upon benzol, the only domestic-made automobile fuel of the country, was the direct cause of the taxicab strike in Paris, which still keeps 4,000 men out of work. (The taxicab drivers pay for the fuel used by them, under the arrangement which was in force with the principal cab companies of Paris, and thus the new tax fell on them).—From *L'Auto*, February 3.

Stage for Rural or Interurban Traffic—The illustration of an English motor stage coach here shown, Fig. 2, from the pages of *Le Poids Lourd*, suggests scenes from the genial country life of the British Isles. On the "imperial" of this tallyho, where room for the travelers' luggage is provided between the back-to-back cross-seats, Jingle and Snodgrass, Alfred Vanderbilt or Howley might be equally at home. But the heavy car-

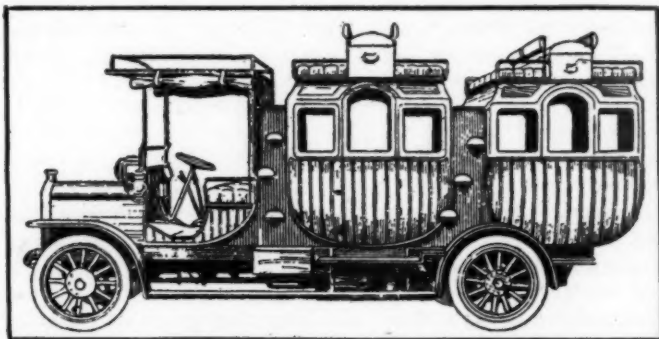


Fig. 2—One of England's modern motor stages

riage work also suggests those finely-groomed roads for which globe trotters now begin to agree that England should be famed, rather than France, since the latter country is allowing her road inheritance to fall into bad repair while awaiting the final discovery of a material which will endure at the same time the crush of horseshoes and the suction of the speeding rubber tires.

Insurance for Springs—A business has been established by an engineer, E. A. Della Santa, at Brussels—the address being 12 Rue Lannoy—which undertakes to supply owners of automobiles and motor trucks with free replacements of all broken vehicle springs, no matter how the injury occurs or where, so long as it is not due to an accident covered in ordinary accident insurance. The fees are distributed over a period of 3 years and amount to 80, 70 and 60 francs for an 8 to 12-horsepower vehicle, reaching 120, 110 and 100 francs for a vehicle of more than 50 horsepower. The contract made with the insured includes a terminal clause to the effect that any dispute which may arise shall be judged by the Court of Commerce at Brussels. As the company replaces all springs with its own material and by its own workmen, it is perhaps to be looked upon as the advance agent of a spring-making concern—which would not make the venture less interesting.

Protected Aluminum—Aluminum, in whatever form—castings, sheets, wire, tubes or finished articles—can be made proof against any and all deterioration from alkali, acids, salt water and any other chemical influence by the following treatment:

(1) Dip in an alkaline solution; then neutralize in an acidulated bath and wash in pure water. (2) Dip the object successively in solutions of chloride of iron, chloride of zinc, chloride of tin and chloride of ammonium. (3) Chloride of copper

to which there is added 5 per cent. or more of a tartrate of soda and 5 per cent. or more of tartrate of chalk is dissolved in sal-ammoniac, and the object is now dipped in this solution. (4) Thereafter it is subjected to the action of alcoholized acetate of zinc and is neutralized in water containing carbonate of sodium or potassium. (5) Wash in a weak sulfuric or nitric acid bath; then carefully wash and clean in clear water, and thereafter heat the object to a temperature above 100 degrees centigrade.

If the treatment is stopped at this point, the aluminum has been rendered fit for receiving any kind of metallic or varnish coating, and this in itself is a considerable improvement of the material. But if it is to be rendered completely proof against all exterior influences, the treatment is continued, as follows:

(6) Wash with a hot solution of crude mineral oil mixed with siccatives and a small amount of resin gum. This mixture before being employed must be treated with oxygen or a suitable oxidizing body. (7) Finally the object is dried completely under heat and washed in hot caustic soda or any other strong alkaline solution.

Aluminum so treated will not only resist acids, alkalis and salt water, but, if it is painted or varnished and it becomes desirable to remove the paint or varnish coat by means of hot alkaline solutions, this can be done without in any manner affecting the surface of the aluminum.—From article by Mr. Pucillo in *La Metallurgie*, February 7.

Brazil Organizes Para Production—President de Fonseca has signed an enactment by which the exploitation of the rubber tree forests of the Amazon river region, and in fact in all of Brazil, becomes subject to strict regulation by special officers of the state. Certain rules for tapping and for replanting are incorporated in the measure, the passage of which was due to the necessity of protecting the rubber trade against the ever-increasing competition from plantations in the far Orient, especially near the Straits Settlement of Malacca and the Indian archipelago.—From *La Métallurgie*, January 23.

Ductile Electrolytic Iron—A rapid method for producing ductile, workable iron by electrolytic precipitation has been perfected by Dr. Franz Fischer, professor at the Technological High School of Charlottenburg, Berlin, and has been taken in hand industrially by the Langbein-Pfanhauser Works, Ltd., of Leipsic. The material is especially adapted for electrical purposes, foundry molds and matrices for press work. The firm mentioned has secured patents for its application to water jackets for gasoline motors.—From *Metall-Technik*, Oct. 28.

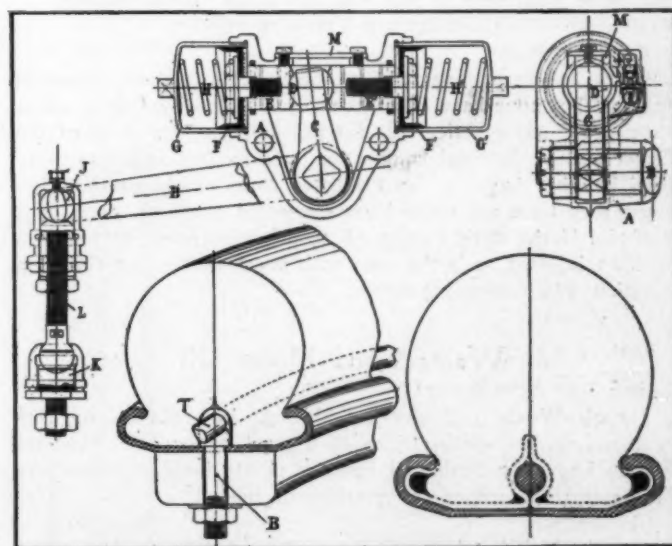


Fig. 3—Pneumatic spring element and solid cushion tire, forming parts of the Amans vehicle suspension recently brought out in Belgium. The tire shown in sections taken at and between bolts B

Letters Answered and Discussed

Handy Method of Replacing Piston; New Gasoline Gauges; Getting a Car Out of a Hole; Quieting Timing Gears, Etc.

Replacing Piston in Cylinder

EDITOR THE AUTOMOBILE:
[3,030]—Would you kindly suggest a method whereby the piston and rings may be replaced in the cylinder without any danger of damaging them? I have taken the piston out for the purpose of examining the piston rings and found that several of them needed replacing, but now that I have got it out I am not quite sure as to how to go about replacing it.

Brooklyn, N. Y.

AMATEUR.

The process of replacing the piston in the cylinder is one that always proves more or less puzzling to the amateur. In most cylinders the casting is finished off with a bevel which forms a sort of wedge and allows the piston to be pushed into place. As the piston is forced into the cylinder the bevel on the cylinder compresses the rings. Another method which is often used is to take several thin strips of metal and place them in the cylinder, bending them out where they leave the cylinder, these for guides and also serve to compress the rings. One of the handiest methods is shown in the accompanying illustration, Fig. 1, in which a cord is wound and drawn together about the ring. The piston can then be pushed a distance into the cylinder.

Regarding Fuel Injectors

EDITOR THE AUTOMOBILE:

[3,031]—I have been a constant reader of THE AUTOMOBILE for 10 years and have noted the changes and improvements in the industry through its columns. During all this time I have not seen anything regarding fuel injection applied to automobiles. Why has some one not developed this? Is it not practical? How would a fuel injector take which could be controlled from the steering wheel with the same ease as the present day carbureter and which would act as a self-starter at the same time? Would it not be more economical than the present carbureter and at the same time help in starting the motor in the winter? I would like to see this discussed in your columns.

Bay City, Mich.

W. B.

Work has been done on fuel injectors to a great extent in the past but none have ever been developed to a point at which they are of any practical use for automobiles. On some of the larger marine internal combustion motors fuel injectors were used but they have not been adopted to automobile motors because they have not seemed necessary nor practical. It is very doubtful if the same quality of vaporization could be obtained with an injector as is the case with a carbureter, but this is a question which remains open.

Wants Good Motor Oil

EDITOR THE AUTOMOBILE:

[3,032]—Would you give me, through the columns of THE AUTOMOBILE, the specifications of a good motor oil? I would like to know the flash and burning points besides any others necessary to determine the qualities of the oil.

Chicago, Ill.

F. C. NEUENFELDT.

An oil which has been often recommended has a flash point of 400, burning point of 450, viscosity of 230 at 70 degrees on a Sayboldt viscosity meter, specific gravity 27 at 30 degrees and cold test from 20 to 28 degrees.

Two Units Should Be Used

EDITOR THE AUTOMOBILE:

[3,033]—Would you kindly give me a little information in an early issue of THE AUTOMOBILE? I would like to know if it would be possible to operate a two-cylinder, two-cycle Fairbanks-Morse motor from one unit of a Splitdorf coil.

Deland, Fla.

J. G. D.

The cranks of the Fairbanks-Morse two-cylinder, two-cycle motor being at 180 degrees from each other, it is easily possible to wire the motor so that it is operated from one unit of the Splitdorf coil. This is inadvisable, however, as it throws too much work on the coil and it is therefore better practice to use two units.

Quieting Timing Gears

EDITOR THE AUTOMOBILE:

[3,034]—Will you please explain, through THE AUTOMOBILE, the best practical way to remove the noise from the timing gears without replacing them?

I would also like to charge a set of magnets and would like to know if this can be done with a lighting circuit of 110 volts. Would it be better to treat them singly or in a bunch? I would like to have you explain to me how to go about this if it is possible?

GUY LAIRD.

Quay Center, Kan.

Some makers of cars make their timing gears in oversizes so that if at any time a set becomes noisy owing to lost motion, which is generally the cause, it is only necessary to replace a wheel of the set in order to render them quiet. As a general rule to quiet timing gears effectively it is necessary to replace them by a new set and it may be stated that this is the only permanent way other than that mentioned above. Packing the casing with grease will quiet the gears for a while but it will be found that there is no permanent cure other than replacement.

A direct current lighting system may be used by first charging a storage battery and then charging the magnets from that. In charging the magnet from the lighting system direct, you would short-circuit the lighting system and would cause trouble. Most lighting systems are now using alternating current and in this case you could not even charge the storage battery.

Mileage of an Electric

EDITOR THE AUTOMOBILE:

[3,035]—Would you like to see the electric pleasure vehicle taken up and discussed? I believe there are many people who would be interested in learning something about the capability of the electric for ordinary road work, its practical mileage, hill climbing ability in connection therewith, care and attention required in charging, etc.

I have been trying to get information from several of the best known makers of electrics, and named conditions which all but one of them unhesitatingly stated could be successfully overcome by their respective cars. Some of them seemed to take it for granted that you could coast for at least half of the time, which made the question of mileage look larger than ever, for, with women driving, the proposition of running down hill at high speed and to coast, as a maker stated, at least twice the

length of the hill, would not be feasible. Another well-known manufacturer of electric pleasure vehicles flatly stated that the conditions were probably too severe for an electric. Conditions briefly: Impracticable to charge on trip; minimum mileage, 60; road, largely level, though some rolling ground, with one hill with one mile of 12 per cent. grade to be climbed twice in a day's run. Surface good, partly gravelled and partly crushed rock, well kept.

Any information I can get on the subject will be appreciated.
Eureka, Cal.

A. D. KELLOGG.

This is, on the face of it, a matter where the driver is concerned. An operator of considerable experience may be able to negotiate the distance without trouble, while at the same time it would bother another very much to avoid being stalled somewhere along the route. It is not safe for a woman to try racing down a hill as you state in order that the charge may be spread over as great a distance as possible. For this reason, a man, to whom the speed attained by coasting the full length of the hill would not be anything of importance, would be able to carry the car further on the same charge. The most economical speed to use in hill-climbing and several other factors which are known only to those who have had experience with electrics would have to be considered before it would be possible for the maker to state just what his car can do.

The electric is essentially a city car although a run out in the suburbs is not a difficult matter. Still, it must be remembered that it is foolish to venture a great distance from a charging station. When the operator of a car has to depend on coasting down hills in order to reach home with his car he is rather apt to be begging some of the passersby for a tow occasionally. It will be very often the case that the car is compelled to stop along the road in order to allow some other vehicle to pass; or, two other vehicles which are passing each other in the road ahead will cause the road to be filled to such an extent that it will be necessary to stop or at least to slacken speed so that the velocity acquired on the hill will not be sufficient to carry the car very far after it has reached the bottom. The case you mention is one of those which can never be determined until tried out although it does not seem at all abnormal for a modern electric car.

Submits Other Gauges

Editor THE AUTOMOBILE:

[3,036]—I notice that in THE AUTOMOBILE for February 1, Mr. Trevor takes friendly exception to my previous design for a gasoline gauge. So here are two other designs which may prove more suitable.

Bore a hole in the filler cap and tap the hole to fit a 1-4-inch brass plug. Solder a piece of thick copper wire into a hole

bored into the bottom of the plug. This wire should be long enough to reach nearly to the bottom of the tank. Through the squared portion of the brass plug, drill a small hole through which a piece of heavy steel wire about 2 inches long may be soldered to act as a handle when unscrewing the plug. This obviates the necessity of using a wrench. To ascertain the height of the gasoline in the tank, simply unscrew the plug and the height of the gasoline will be shown on the wire. Nicks filed in the wire would show the height of the gasoline in inches.

This indicator could be used on pressure-feed gasoline cars while that advocated by Mr. Trevor could not be so used. This system, by eliminating the dirty stick so often picked up at random and cleaned off in the gasoline, prevents the introduction of dirt into the tank which may ultimately find its way into the carbureter.

Some automobilists carry a folding pocket rule but this requires the use of a wrench to remove the filler cap of pressure-feed gasoline cars while the small brass plug may be screwed sufficiently tight with the fingers.

Another level indicator to be used on gravity-feed cars is shown at B. It may be easily made by soldering a metal tube into the filler cap, drilling a small hole through the cap to permit a piece of light steel wire to pass through freely. This wire is attached to a cork float which should be thoroughly dried and given two coats of shellac. The upper end of the steel wire should be bent into a loop to prevent the cork falling out when the filler cap is removed.

Allegheny, Pa.

MURRY FAHNESTOCK.

Getting Out of a Hole

Editor THE AUTOMOBILE:

[3,037]—Would you kindly tell me if there is any method which is practical, of getting out of a hole and not damaging the car in any way? Twice recently I have been caught in a hole in the road and on both occasions had to secure the services of a strong horse to get me out. These two accidents were close together and are the only ones I have ever had.

Rome, N. Y.

C. P. MOORE.

It may be well said that the best way to get out of a hole is not to get into it. The driver should be on his guard against such accidents as damage to the car is very apt to result. An accident of this kind does not speak well for the chauffeur. There is one method which has often been used with success and that is shown better than can be described in the accompanying sketch, Fig. 3. As the wheel rotates the board is pulled beneath it so that the tractive effort of the wheel is increased.

This will generally be found to be effective, but the rope must be very strong.

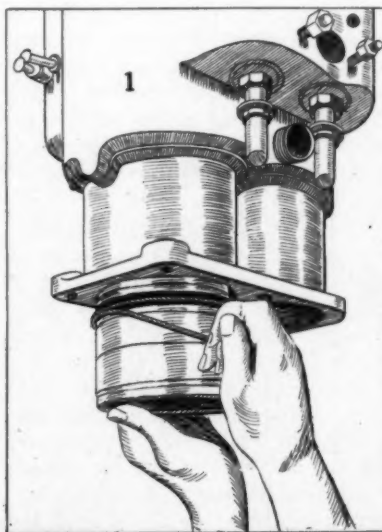


Fig. 1—Replacing piston

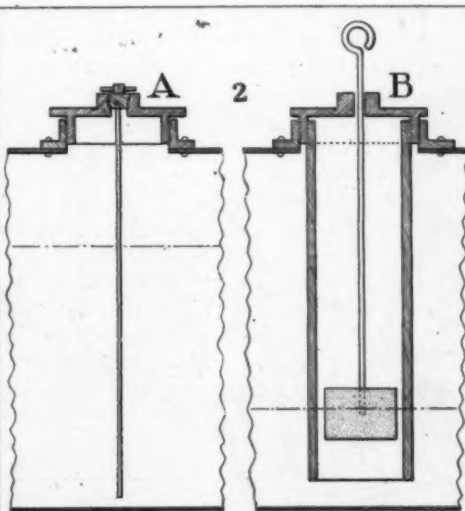


Fig. 2—Two forms of gasoline gauge

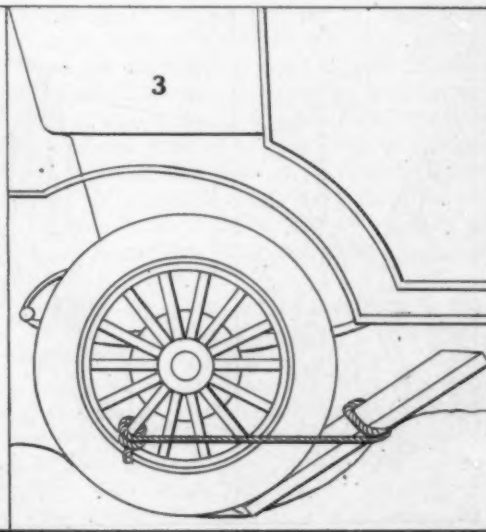


Fig. 3—How to get a car out of a hole

Pointers for Repairmen and Drivers

Causes and Prevention of Overheat in a Motor—Insufficient Oil; Slipping Fan Belt; Poor Carbureter Adjustment, etc.

PREVENTING an Overheated Motor—There are several causes leading up to the overheated motor and all of them are easily prevented. Many cars will run very well along a level stretch of country, but when they are called upon to negotiate a long hill, symptoms of overheating will occur. The cause of this is the late spark which is necessary when the driver is loath to drop into a lower speed and thus allow his motor to run fast enough so that the spark does not have to be retarded to such an extent. It need not be stated that for this reason alone it would be well to drop into a lower gear whenever the motor begins to labor on a hill. It does not pay to allow the temperature of the motor to rise as it will whenever it has traveled for some length of time on a retarded spark. The cooling water will often be found to boil after a climb and the steam which passes through the radiator cap represents a certain amount of the cooling fluid which is being lost. This might not mean very much in most cases, but where water is somewhat scarce it is serious. Each gill of water which is lost from the cooling system represents a corresponding increase in the tendency to overheat.

LOST HEAT MEANS LOST POWER—The amount of heat carried away from the motor is shown by the weight of the water used in a unit of time and the difference in the entering and leaving temperatures of the water. If 150 pounds of cooling water are passed through the radiator and the cylinder jackets in a minute and the difference in temperature between the water which enters the motor and that which leaves it is 30 deg., there are 4,500 British thermal units of heat carried off each minute. This loss of heat although necessary is not utilized in driving the motor and, hence, is not a factor which is to be augmented to any extent, but, on the contrary, should be kept down. In horsepower the 4,500 B.t.u., above mentioned, would be in excess of 10. This is not realized by many of those who are driving their cars with the spark continually retarded and it may be safe to state that if it were, they would soon cease. Even with the best of care, the heat which is thrown away through the radiator amounts to about one-third of the total

heat in the gasoline, but when care is not used in connection with governing the spark, the heat thrown away begins to assume proportions which are greatly in excess of this. There are several ways of keeping the motor as cool as possible and hence of running with the highest possible thermal efficiency, or in common terms, of reducing the cost of operation of the motor to a minimum.

INSUFFICIENT OIL CAUSES OVERHEATING—Another common cause of overheating frequent with careless drivers is allowing the supply of oil to run below normal. This is the most serious offense of which the driver of a car can be guilty. It is the surest way in existence of spoiling the motor without using an axe or a charge of dynamite. Should the driver feel the motor to be irresponsive to the throttle or spark and at the same time hear a groaning sound, it is time to stop the motor and allow it to cool off. It is also time to use the extra supply of oil which might be along with the car. If this warning be neglected the pistons will soon seize in the cylinders and the car will, in a short time, be seen being ingloriously towed to a repair shop. The damage caused by seizing pistons cannot be readily calculated. It will sometimes happen that no metal is removed from the cylinders, but only from the pistons and in this case the owner of the car will escape with a somewhat smaller bill than would be the case if the cylinders were deeply scored, which is just as apt as not to be the case. At any rate, the cylinders will have to be rebored and the pistons renewed. New piston rings will have to be fitted even if the owner of the car should be so lucky as to have escaped with a merely stuck piston. The latter will only be the case where he has stopped in time when he has heard the warning groan of his motor.

GUARD AGAINST SLIPPING FAN BELT—An elusive cause of a heated motor is the slipping fan-belt. The car may run at ordinary speeds and the owner of the car will be greatly mystified to find that the radiator steams after he has been running for some time. The radiator may be thoroughly clean and all other factors in the cooling system may be in ideal condition

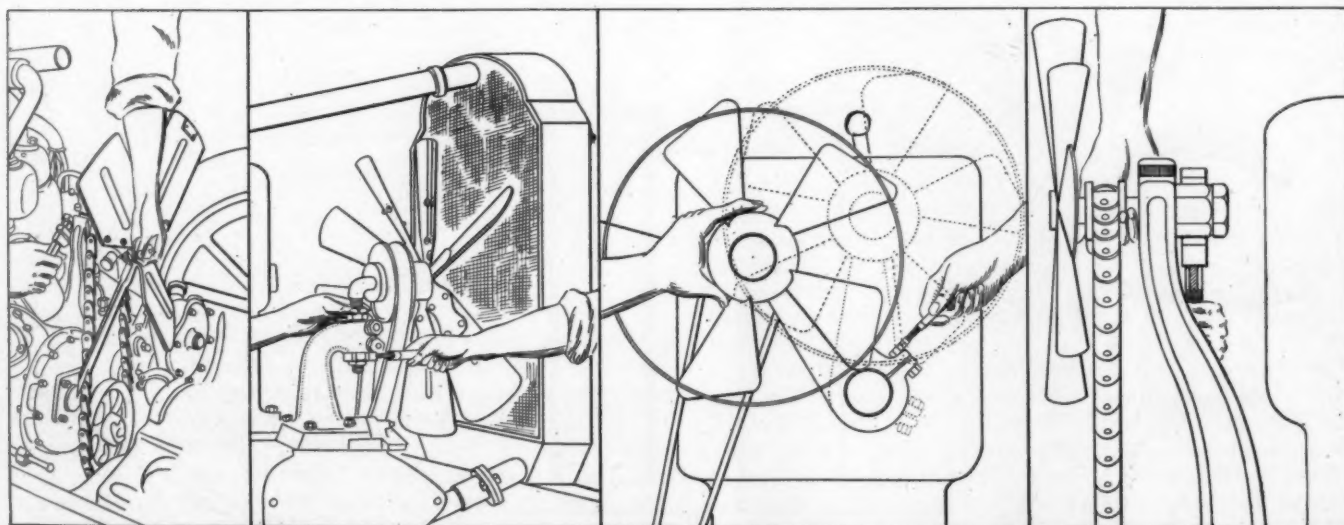


Fig. 1—Methods of tightening fan belt; nut and groove, nut and lock nut, swinging adjustment and rear view of nut and grooved bracket

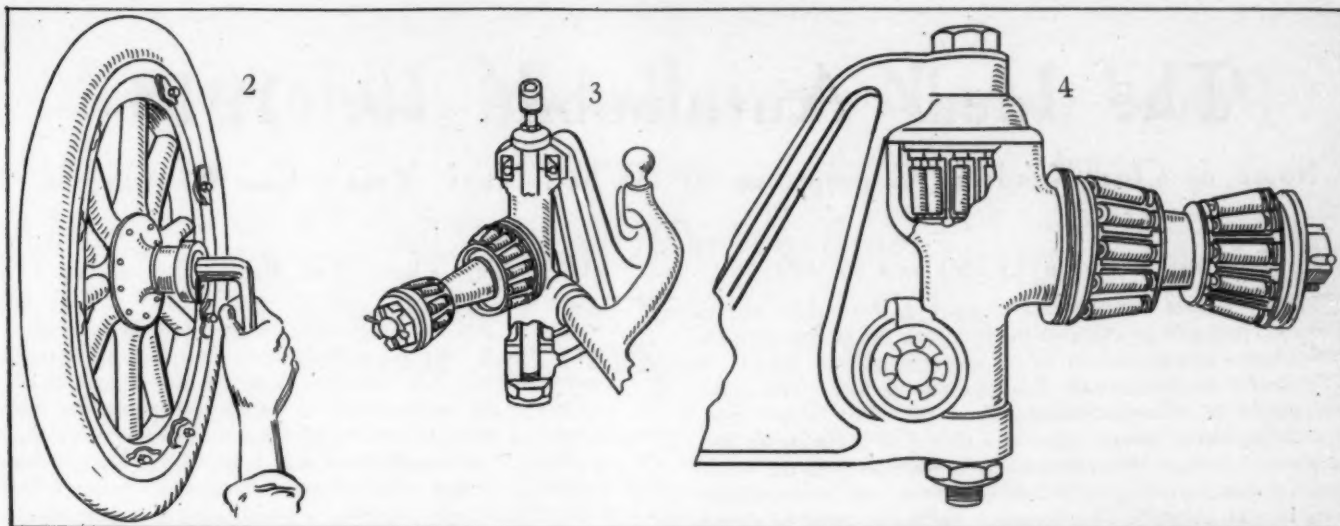


Fig. 2—Removing hub cap. Fig. 3—Roller bearing for wheel with ball-bearing knuckle. Fig. 4—Full roller bearing, knuckle and wheel

and yet the radiator will be hot. The fan-bracket in a belt-driven fan will always have some means of adjustment and it should be used when the radiator becomes hot, as this is apt to be the cause. Some means of fan-bracket adjustment are shown in the illustrations herewith. There are a great many varieties of adjustment but these may serve as a means of comparison with the system employed upon the particular type of car in which the reader is interested. In general when a screw is loosened the bracket may be swung about a pivot or altered in position until the belt is of the required tightness. An oil accumulation on the pulley will often make the belt slip.

CARBURETER ADJUSTMENT AN IMPORTANT FACTOR—Bad carbureter adjustment is in many instances very likely to cause continuous overheating of the motor if the adjustments are so that the mixture is too rich. When the mixture is too rich at high speeds and the spark is retarded materially, conditions are ripe for a rich deposit of carbon in the cylinders as well as for overheating. The rate at which the charge burns decreases as the mixture becomes richer. If the piston is moving at the same rate of speed with a rich or lean mixture, it will be evident that the gases at the end of the stroke will be hotter with the rich mixture than with the lean. With a very rich mixture and a late spark, the gases will not be entirely consumed at the time of exhaust and burning gases will be discharged. The motor will become quickly overheated in this case and the results will be a deposit of carbon and a very poorly running motor. The remedies for these evils are evident and consist merely in making the adjustments necessary. In the case of the carbureter it may be stated that the auxiliary air valve will often be adjusted so that the opening under increased suction is not as large as it should be. In this event the motor will not receive sufficient air when it speeds up and the suction will fall entirely on the spray nozzle so that the mixture is sure to be too rich and the rate of flame propagation retarded to such an extent that the motor will heat up badly.

Taking Up Play in Front Wheels—The front wheels should not be adjusted so loosely that they are allowed to wobble. At the same time, the nuts should not be screwed up so tightly that there is an excess amount of friction caused by the pressure which is created. When the wheels begin to give signs of play it is time that the matter should be taken in hand and the required adjustment made. This is not often understood and a little tip as to how to proceed may be of advantage to the driver who has not been previously called upon to do this work. The hub cap should be first removed. The method of adjustment will then vary according to the bearings upon which the wheels are mounted. If the bearings used are of the roller type, the wheel is slipped further up the cone

and the exterior bearing is closed in upon it. In this manner the wheel is again tightened up and the angle at which it is carried will still be correct. The principle involved with ball bearings is exactly the same as with roller bearings and the adjustments are made in much the same manner. It will sometimes be found that in place of the hexagonal nut by means of which the adjustment is made there is a piece with two or more holes into which a tool is inserted and the piece turned.

The modern cars are so designed that the front wheels do not transmit a turning moment to the steering wheel. To accomplish this result they are made to toe in so that a line through the center of the wheel and through the center of the steering-knuckle pivot intersect at the ground. When the construction is made in this manner, the wheel has no tendency to turn about the pivot of the steering-knuckle every time that an obstruction is met in the road. The reason for this is that the arm of the lever required to exert a turning moment on the wheel will be equal to zero. This arm is measured by the length of a perpendicular dropped from the point of support of the wheel to the line of direction of the force. Since the line through the point of support meets the line of direction of the force at the point of contact of the wheel and the ground, it is evident that the distance will be equal to zero and hence there will be no turning moment about the steering-knuckle.

With a wheel which wobbles on account of loose adjustment there will be a turning moment every time the wheel gets out of alignment. For this reason a car with wheels of this kind becomes hard to steer. The arms of the driver soon become fatigued and the pleasure of running the car is materially reduced. The wear on the tires is apt to be increased with a badly adjusted wheel as the alignment is sure to suffer if the bad effect of the loose wheel is not corrected as soon as it appears. Where the front wheels toe in to any extent in front the wear on the tires becomes most abnormal. This is readily perceived when it is considered that instead of purely rolling motion, the wheel takes on a motion which is a combination of roll and slide. To slide a tire along a gritty road, with a weight of 500 pounds or more upon it is just about as beneficial as running it along a grindstone. A very small amount of bad alignment does not cause the rapid wear that is the case with a wheel which has been badly knocked out of place by an accident of some nature. A bent axle or other drastic cause may make a casing wear out in the short space of 40 miles. The bad alignment due to a wheel which is loose on the axle is very slight and hence the wear is not detected so readily as when the fault is due to some other cause, still, at the same time, the rapidity with which the tire is working its way to the scrap-heap is greatly in excess of what it would be under ordinary circumstances.

The Ideal Automobile for 1913

Some of Our Readers' Conceptions of What Next Year's Car Should Be

To Cost Between \$1,850 and \$2,000

EDITOR THE AUTOMOBILE:

I will give my idea of the best 1913 car to cost between \$1,850 and \$2,000.

The motor should have six cylinders cast en bloc. The cylinders should be offset and should be of the silent Knight type, with sliding-sleeve valves. The bore should be 4 1-2 inches and the stroke 6 inches. The motor must be water-cooled, the circulating system including a cellular radiator and a centrifugal pump of high capacity. The magneto and pump could be placed across the front of the motor on a transverse shaft, while the fan should run on bearings of ample size. Ignition should be by means of a Splitdorf magneto and a storage battery with a single-unit coil and one set of spark-plugs. I would specify a float-feed carbureter with an auxiliary air supply and water-jacketed so as to maintain a constant quality of mixture at all times and under all weather conditions. The carbureter should have a dash adjustment so that the quantity of air supplied may be varied at the will of the operator.

The lubricating system should be of the circulating type, with a sight feed on the dash in order that the driver may know the condition of the oil at all times. The oil tank should hold 2 gallons of oil, while the auxiliary tank should hold an additional supply of 2 gallons. The steering gear ought to be of the worm-and-sector type with the wheel placed on the left side of the driver's seat. The gear-shifting lever should be in the center of the car. The steering wheel should be 18 inches in diameter, with the throttle lever on top as well as the spark lever.

The power should be transmitted to the gearset by means of a leather-faced cone clutch with cork inserts. The gearset should be of the selective type, having four forward speeds and one reverse. Direct drive should be on fourth speed. The shafts of the gearset should be carried on annular ball bearings. Straight-line shaft drive should be used with the gearbox placed amidships on the car. The rear axle should be of the floating type, with a large cover plate on the differential housing so that these gears may be readily inspected when necessary. The axle should be carried upon annular ball bearings. The front axle must be of the I-beam type with large annular ball bearings.

Both internal and external brakes should be specified, while the drums ought to be 18 inches in diameter by 3 inches in width. Equalizing rods should be placed on both sets of brakes. The springs should be semi-elliptic all around, the front 45 inches in length and the rear 55 inches in length. Hartford shock absorbers should be fitted all around. Oil cups must be placed on all spring shackles and steering knuckles. The wheels should be of wire, with demountable rims and 38 by 4-inch tires.

The body should be of the four-passenger torpedo type hung between the axles. The wheelbase ought to be about 132 inches with a road clearance of 11 inches. The weight of this car would be in the neighborhood of 2,400 pounds.

The equipment of the car ought to be complete. It should consist of a top, top boot, zig-zag windshield, electric lights with Gray & Davis dynamo, electric horn, Warner speedometer with the light so placed that the oil sight feed is illuminated at the same time as the indicator. A self-starter should be fitted as well as a power pump for the tires. A tire carrier with two extra rims should be placed on the rear, while the tool boxes should be placed beneath the running board and run its entire length. All the lamps and metal parts should be nickel-plated.

Bennington, Kan.

D. A. N.

\$3,000 Car That Will Prove Attractive

EDITOR THE AUTOMOBILE:

I am sending you my description of the ideal car for 1913. The motor should have six cylinders of 4 1-2 inches diameter and 6 inches stroke. The cylinders should be cast in one block. The bearings of the motor should be plain, and the valves should be inclosed in a case cast on the cylinders. The lubrication system should be a combined splash and force-feed. The cooling system ought to consist of a cellular radiator and a water pump of the centrifugal type. Ignition I would specify as the Bosch dual system with hand spark control. The carbureter should be of the Schebler type, with gravity feed of gasoline. The gasoline should be carried in a 20-gallon tank located beneath the seat of the car. The clutch I would select as best is the multiple disk, in oil. The transmission should be selective with sliding gear, unit motor speeds, four forward and reverse. Roller bearings throughout. The drive should be by shaft, with worm-gear differential, the gear ratio being four to one. The axles should be of I-beam section for the front and floating for the rear. The steering should be by irreversible worm-gear with an 18-inch wheel. The road wheels should be of the artillery type and shod with 36 by 4 1-2-inch tires. The wheelbase should be 136 inches, the tread standard. The brakes should be on the rear wheels; the service brakes being of the external contracting type, operated by a pedal; the emergency of the internal expanding type, actuated by a lever.

As to the equipment of this ideal car, which should cost about \$3,000, all on, it should include top, curtains, dust cover, speedometer, windshield, electric lights, dynamo, battery, Q. D. demountable rims, extra rim and tire, tire irons, electric horn, shock absorbers and compressed-air starter, with compressor.

Malta Bend, Mo.

A SUBSCRIBER.

Self-Starter and Electric Light for \$2,000

EDITOR THE AUTOMOBILE:

The following is my ideal car for 1913. It is to be a five-passenger touring car, with a four-cylinder block motor, of 4 inches bore by 4 3-4 inches stroke, water-cooled principally and with air cooling by means of vanes in the flywheel. The motor should be suspended at three points and be equipped with an automatic carbureter and Bosch Dual Magneto. A multiple-disk clutch and a four-speed transmission should be used.

The drive should be by a shaft to the differential, and the floating axle be equipped with 34-inch wheels. Tires should be 34 by 4 1-2 inches all around, mounted on Q. D. rims; springs should be semi-elliptic 38 by 2 in front and full elliptic about 42 by 2 1-2 in the rear. The body should be of a torpedo design, with straight lines throughout, a hood converging in front, fore-doors, and with a slanting rear portion of the car to give racy appearance. Provision should be at the rear for inconspicuous arrangement of luggage, and the running boards should be kept free from battery, oil cans and gas tank, as I would desire an electric lighting and starting dynamo on this machine. The automobile should be painted dark brown in a nut-tint, to conform to the road surroundings. Two 15-candlepower headlights, two side lights and tail light would constitute the lighting equipment, and a light indicator for informing the driver of the car behind of one's intention of turning and stopping should also be contained in the equipment. This car could be sold for \$2,000.

Bangor, Me.

C. RIKER.

Automobile Metallurgy Made Easy

By E. F. LAKE.

XIV—Low Carbon Steel

As a Rule, the Greater the Carbon Content, the Greater the Hardness

WHILE it is important to know the manner in which steels are made, that is, whether by the Bessemer, open-hearth, crucible or electric processes, it is still more important to know what they are composed of. The steels that are in the open market for automobile construction, as well as for all other purposes, are therefore classed under names that would indicate the composition of the material.

The iron ore, which is the natural product from which all steels are made, is first reduced to pig iron in furnaces and this is afterwards treated by the processes described in former articles, to manufacture it into steel. This iron ore in its natural state contains carbon, manganese, silicon, sulphur and phosphorus. Of these the carbon, manganese and silicon have been found to be useful in various percentages, while the phosphorus and sulphur are very injurious elements in all but exceptional cases. The ordinary steels that are in universal use contain these five elements and their combined percentage varies from 1 to 3 per cent., while the balance, or from 97 to 99 per cent., is pure iron. When talking of the chemical composition of iron or steel only the elements other than iron are mentioned, as it is taken for granted that the balance is iron.

Nickel, chromium, wolfrum, vanadium, titanium, aluminum, copper and a few other elements are sometimes added to steel to increase its strength or wearing qualities, or effect other properties in a beneficial way. As these elements are not universally found in iron ore, the steels in which they are used are called alloys or alloyed steels to distinguish them from the ordinary carbon steels. Sometimes the manganese and silicon are used in much larger percentages than they are in the ordinary carbon steels, and these are then classed with the alloys.

Carbon steels are so named because carbon is the most important element in the metal. By raising or lowering the carbon content of steel a great variation can be given its strength, toughness, hardness, wearing properties, etc. Thus they are made to cover a wide range of usefulness. For commercial purposes ordinary steels are divided into three classes, namely, low-carbon, medium-carbon and high-carbon steels, but we will only deal with the low-carbon steels in this article. Between the low-carbon and medium-carbon steels there can be made a fairly distinct division.

All steels that do not contain any special alloying material and have a carbon content that is below 0.30 per cent. are called low-carbon steels. Some, however, may have two other names by which they designate such steels; namely, soft or machinery steel.

When the carbon content is below 0.30 per cent. steel cannot be hardened enough to prevent it from being cut with a file. At about this percentage, however, this phenomena begins to show itself and with the carbon in any percentage above this steels can be heat-treated and made so hard they cannot be cut with a file or any steel tools. This is done by heating them to a good red color and then submerging the heated metal in a water, oil or brine bath and thus suddenly quenching the heat. As a general rule, the higher the carbon content the greater will be the hardness of the steel.

The percentage of manganese is kept lower in the high-carbon steels than in the medium or low-carbon steels, in the latter of which it varies from about 0.40 to 0.70 per cent. The silicon

varies from 0.10 to 0.30 per cent, in nearly all carbon steels, while the sulphur and phosphorus are always reduced to as low percentages as is commercially possible. A large part of the low-carbon steels are made

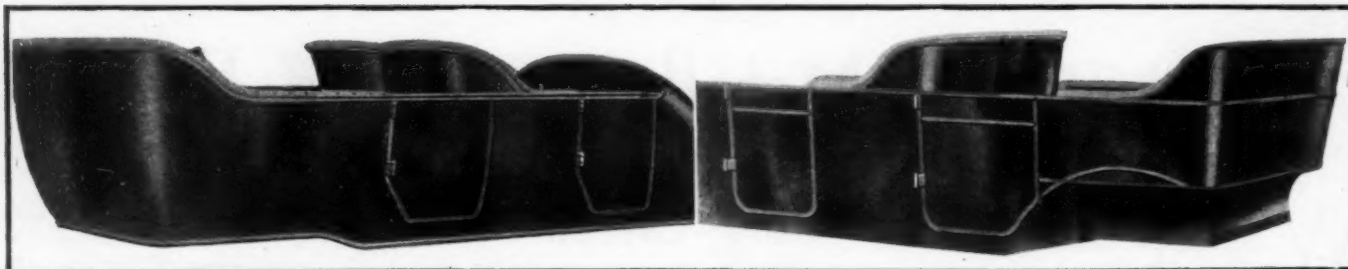
in Bessemer converters and hence the impurities are not removed to as great an extent as when the metal is made by other processes. Most of the low-carbon steels used for automobile purposes, however, are made in open-hearth furnaces, and hence are of a better grade than the Bessemer steels.

The steels that contain from 0.10 to 0.20 per cent. of carbon are used quite extensively for automobile parts that do not require any great strength. Such parts as are pressed into shape are nearly always made from this low-carbon steel, as it can be formed into various intricate shapes without breaking when it is being bent in the cold state. Machine tools do not cut it readily, however, as the metal tears out in stringy strips instead of cutting smoothly. Some of the parts that are the most commonly made from these steels are the various longitudinal and cross-members of the frames, rear-axle housings, brake drums and bands, and other parts of a similar nature. In some instances, the change-gear case is pressed out of soft, low-carbon steels, and nearly all of the seamless tubing used for automobile parts is made from such material. As the shapes into which the soft open-hearth steels are manufactured do not readily lend themselves to any kind of hardening operations, they are seldom given any heat-treatment. The cold-rolled or cold-drawn stock is always pressed into shape when cold, and the fine grain structure given the metal by the rolling or drawing operations is retained and its strength is not impaired. When such stock is heated before forming it into shape, the heat causes the grain of the metal to coarsen and the strengths are lowered to those of annealed steel.

While these steels cannot be hardened to a point that will prevent their being filed, their mechanical properties can be improved by heat-treating them in much the same manner as when hardening steels with a high-carbon content. It is seldom, however, that the tensile strength can be raised to 100,000 pounds per square inch, whereas steels with a high-carbon content can be given double the tensile strength and elastic limit of those containing around 0.20 per cent. of carbon.

When steels reach a carbon content of 0.30 per cent. they are used for more important parts as they can be readily forged and machined, and the benefits obtained from heat-treatment are more apparent. Hence, this steel is used for such parts as step and lamp brackets, axles, levers, driving shafts and other parts of a structural nature, or for numerous parts where forgings may be used that are not subjected to any great strains which are apt to prove dangerous.

Low-carbon steels that are well enough made to be low in the percentages of impurities they contain are often used for the manufacture of gears that are to be carbonized or case-hardened. When carbonized, the outer shell will have a high carbon content and be hardened, stiffened and strengthened and thus increase its wearing properties and resistance to strains, while the core will remain soft and ductile and prevent the piece from being broken easily. For such work steels that contain from 0.10 to 0.15 per cent. of carbon are usually used, while the proportion of phosphorus, sulphur and other impurities is kept as low as possible.



Typical examples of the American body builder's art—Hayes all-metal bodies

American Methods Count in Body Making

Enormous Output Permits of Specialization in Factories

MANY trades have benefited by the coming of the automobile and not the least of these is that of the coach-maker. For some time previous to the advent of motor-driven conveyances the various types of horse-drawn vehicles had been conventional in design, undergoing practically no change from year to year. The great increase in business caused by the demand for large numbers of automobile bodies put the entire industry on a new basis which necessitated many improvements in methods of manufacture, as well as in the design and material of the product. Automobile body design is continually changing, new ideas being introduced into each model.

When the coach-makers first began to make bodies for automobiles they clung to many of the features which they were accustomed to use in carriage work. For instance, the first bodies were all of wood. Nowadays some of the companies use wood bodies, but the great majority employ sheet or cast aluminum or sheet steel. A wood skeleton frame is used, of course, but the body proper is of metal, bent and stamped to shape.

The first step in the manufacture of the all-metal automobile bodies is the building of the skeleton frame. This is made of a fine quality of selected hard wood which, after having been cut to fit, is given a very smooth finish and is then strongly screwed together. Then the sheet metal which is to be used in the body is placed in the great press shown in the illustration together with the die and is stamped to shape in two sections. These are electrically welded in such a skillful manner that the seam is practically imperceptible. The metal is then fitted to the wooden frame and the body is all ready for the application of the upholstery.

The Hayes Manufacturing Company, of Detroit, Mich., which builds all-metal automobile bodies and makes various other automobile parts and accessories, is one of the largest users of sheet steel in the world. Not all of this steel is used in the manufacture of bodies, as the company makes and sells great numbers of metal tool and battery boxes each year besides supplying automobile makers with fenders, running-boards, mufflers, etc., in large quantities, but the bodies require the ma-

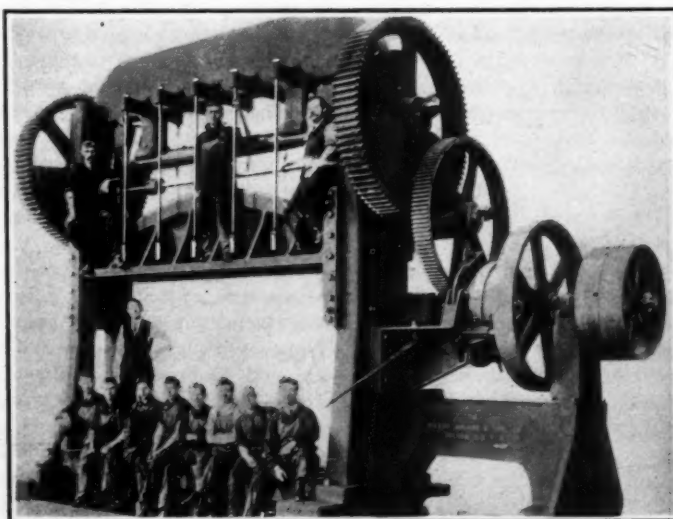
jor part of it. In this company's plant metal bodies of all sorts are built for the most costly and luxurious cars made in the United States as well as for those of lower price.

One of the most interesting features of the Hayes factory is the new steel press, which is of such tremendous size that a special building had to be constructed for it. Its weight is 150 tons, or 300,000 pounds. The bed of the press, which contains the dies for the steel bodies, measures 12 feet by 4 feet and turns out the whole side of a body with a single blow. The dies weigh several tons apiece. The several parts of the body turned out by the press are then electrically welded together. The resulting bodies are remarkably uniform.

When these methods of manufacture are considered it is not a cause for wonder that one of America's foremost coach-making authorities, lately returned from Europe, said that foreign body-makers will never be able to compete with American makers. While abroad this gentleman made a careful study of the general trend in design, as well as of the European methods of production. He says that the reason for the superiority of the American bodies is that the manufacturers turn them out in such great numbers that special machinery of a highly developed character is necessary. This not only increases the quantity of the output, but also improves its quality. Methods are far different in Europe. For example, there is one factory in Belgium where 750 bodies are built. There are 750 men employed in the factory, or one for each body produced. The bodies cost \$1,600 each. Of this, \$420 represents the cost of the labor put

upon the body and the rest the cost of materials and the overhead expense. Moreover, there is practically no uniformity of appearance in the bodies turned out under this system. From the factory methods employed it is easy to see why foreign body work is so expensive.

American body-makers are fully alive to their opportunities and their products are now beginning to pour into the markets of practically every country in the world. They have found out that system counts in their trade just as in everything else and they are not slow in the practical application of the knowledge they have gained.



Giant press of Hayes Manufacturing Company

New Rotary Muffler

Designed to Eliminate Back Pressure and Increase Efficiency

UNIQUE in its design, the Calkins muffler is worthy of more than passing attention. The back-pressure caused by the ordinary muffler is its greatest drawback, and it has long been the effort of the designer to produce a muffler in which the remaining pressure of the gases in the cylinder will be expended upon something other than producing what is known as back-pressure and which is a direct source of loss of power. In this rotary muffler it is shown by the use of a U-tube that the back-pressure is eliminated and hence there is an appreciable gain in the power of the motor.

The primary theory of the new muffler is the fact that the exhaust gases must be removed in some manner other than by their own volition. If not, they impede the following charges and choke up the passage, causing a loss of power.

With this simple fact in view it is apparent that a device arranged to carry the hot vapor away as quickly as it forms would be the proper and effective way to handle it. The principles of adhesion are therefore taken into consideration and the wheel is furnished with flanges, in some cases two—one on each side—and sometimes three.

In the first case, where two flanges are to be used, the wheel is adaptable to the larger type of gas engines—such as automobiles, trucks and motor boats—while in the second case, with three flanges, it would be adaptable to engines used in aeroplanes, the construction being necessarily light.

Considering the principle of adhesion in this invention, it enters into its operation in this manner: The flanges are provided with angularly cut notches in the inner side. Where there are two flanges such notches are situated somewhat obliquely to the true radial line.

Interposed between these flanges is one, or more, diaphragm plates. In some cases it would be preferable to have such diaphragm plates fitted with inlet and outlet ports. While in other cases one or more thin plates might be necessary to interpose instead.

The object of these plates is to separate the incoming gas from the outgoing gas and to form a means to positively eject the major part of the latter so as not to impede the incoming amounts. As the wheel rotates as a fixed member to the crankshaft and the gas is caused to enter between the flanges by the force of the discharge from the manifold, the gases must necessarily first be caught up by the sides of the flanges and forced to adhere thereto by expanding and caused to fly out toward the inside of the casing by centrifugal force.

Situated in the annular chamber are deflecting plates for the purpose of spreading the incoming gas and forcing it into the notches cut in the sides of the flanges, thus causing more positive adhesion.

By adhering to the side of the flanges the gases must be carried around and thus come in contact with the interposed diaphragm plates, and by this contact they are expelled.

By the whirling of the gases in the annular chamber all sound waves are broken up so that when the point of discharge is reached all noise is completely eliminated.

It would be a practical impossibility to perform this duty without the flanges, situated as they are, to form a chamber moving concentrically with the body of the wheel. In the case of the three-flange wheel the center flange is made to do the carrying by means of perforations. In this construction there is one to five interposed diaphragm plates, each one causing a gradual expulsion of the gases. This arrangement makes it possible to build a very light and strong device without adding undue weight to the motor and flywheel.

Calendar of Events

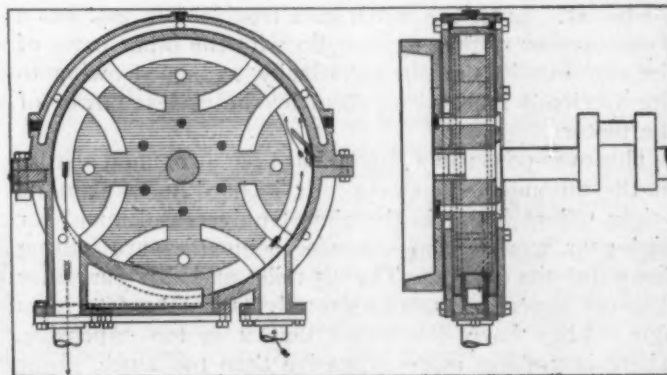
What the Coming Months Have in Store for the Automobilst

Shows

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|--------------------|---|
| Feb. 17-24..... | Pittsburgh, Pa., Second Annual Show, Exposition Bldg., Pittsburgh Auto Show Association, Inc. |
| Feb. 17-24..... | Cleveland, O., Annual Show. |
| Feb. 17-24..... | Newark, N. J., Fifth Annual Automobile Show, New Jersey Automobile Exhibition Company, First Regiment Armory. |
| Feb. 17-24..... | Minneapolis, Minn., National Guard Armory and Coliseum Annual Show, Minneapolis Automobile Show Association. |
| Feb. 19-24..... | Omaha, Neb., Seventh Annual Show, Auditorium, Omaha Automobile Show Association. |
| Feb. 19-24..... | Hartford, Conn., Annual Show, Automobile Club of Hartford, State Armory. |
| Feb. 19-26..... | Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association. |
| Feb. 20-24..... | Binghamton, N. Y., State Armory, Third Annual Show, Automobile Dealers' Association. |
| Feb. 20-28..... | Baltimore, Md., Annual Show, Baltimore Automobile Dealers' Association. |
| Feb. 21-25..... | New Orleans, Washington Artillery Hall, New Orleans Automobile Dealers' Association. |
| Feb. 21-28..... | Toronto, Ont., Annual Show, St. Lawrence Arena, Canadian National Automobile Association. |
| Feb. 22-24..... | Kalamazoo, Mich., Third Annual Show. |
| Feb. 24-March 2... | Brooklyn, N. Y., Twenty-third Regiment Armory, Annual Show, Brooklyn Motor Vehicle Dealers' Association. |
| Feb. 26-March 2... | Paterson, N. J., Annual Show, Fifth Regiment Armory, Paterson Automobile Trade Association. |
| Feb. 26-March 3... | Quincy, Ill., Highland Park Stone Pavilion, Annual Mississippi Valley Show, Quincy Auto Club. |
| Feb. 26-28..... | Charlotte, N. C., Annual Show, Charlotte Automobile Dealers' Association. |
| Feb. 27-March 2... | Elmira, N. Y., Second Annual Show, Elmira Automobile Club. |
| Feb. 28-March 2... | Davenport, Iowa, Annual Show, Davenport Automobile Association. |
| Feb. 29-March 2... | Fort Wayne, Ind., Fort Wayne Automobile Show Association. |
| March 2-9..... | Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc. |
| March 2-9..... | Columbus, O., Annual Show, Columbus Automobile Club. |
| March 4-9..... | Reading, Pa., Reading Railroad Shops, Annual Show, American Exposition Company. |
| March 12-16..... | Denver, Col., Auditorium, Annual Show, Motor Field, A. Wahlgreen, Manager. |
| March 6-9..... | Louisville, Ky., Fifth Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association. |
| March 6-9..... | Tiffin, O., Second Annual Show, The Advertiser. |
| March 12-16..... | Syracuse, N. Y., Fourth Annual Show, State Armory, Syracuse Automobile Dealers' Association. |
| March 25-30..... | Indianapolis, Ind., Annual Show, University Park, Indianapolis Automobile Trade Association. |

Race Meets, Runs, Hill Climbs, Etc.

- | | |
|-----------------|---|
| Feb. 22..... | Bakersfield, Cal., Annual Road Race. |
| April 27..... | Philadelphia, Annual Roadability Run, Quaker City Motor Club. |
| May 4..... | Santa Monica, Cal., Annual Road Race, Motor Car Dealers' Association. |
| May 14-17..... | Chicago, Ill., Commercial Vehicle Test, Chicago Motor Club. |
| May 30..... | Indianapolis, Ind., Speedway, 500-mile race. |
| May 30..... | Salem, N. H., Track Races, Rockingham Park. |
| June 20..... | Algonquin, Ill., Annual Hill-Climb, Chicago Motor Club. |
| Aug. 8-10..... | Galveston, Tex., Beach Meet. |
| Aug. 23-24..... | Elgin, Ill., National Stock Car Races, Chicago Motor Club. |
| Sept. 2..... | Indianapolis, Ind., Track Races, Speedway. |
| Oct. 5..... | Philadelphia, Annual Fairmont Park Road Race, Quaker City Motor Club. |
| Oct. 7-11..... | Chicago, Ill., Reliability Run, Chicago Motor Club. |



Sectional views of Calkins Rotary Muffler

THE AUTOMOBILE

Vol. XXVI

Thursday, February 22, 1912

No. 8

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RECENTLY a large public carrier corporation using automobiles discovered that it had too much motor for the chassis. It started with a 35-horsepower motor, which proved too powerful; in a second effort a 25-horsepower type was discovered to be more than was actually needed for the work, and to-day this corporation is going to fit 20-horsepower motors in its vehicles. There is a lesson in this experience for many car makers. Some engineers have built motors and then installed them in chassis. There was no harmony between the motor and the chassis. Soon the rear axle gave trouble. It was strong enough for certain cars, but too weak for the motor. Later the clutch gave trouble. It, too, was a weak brother to the engine. So with the other parts of the car; one by one they gradually weakened owing to the overloads imposed on them by the useless power of the motor.

This over-power in a chassis has been a common offense in the automobile business. It is hard to explain its origin unless found in the almost universal demand for high-gear work. But the wise companies are cutting down on the power. The 65-miles-an-hour guarantee does not appeal to them as strongly as it did a few years ago. They have discovered that it is too expensive. There is nothing more expensive than too much motor power for the rest of the chassis. There must be a balance, each part made with due regard to all of the other

parts of the vehicle. The chassis should not be a matter of favoritism, giving the lion's share to the motor and starving the running gear or the body.

Too much motor power has been a poor advertisement to the car builders. They have killed the object they set out to attain. Too much motor power has made frequent breaks in the remainder of the chassis. The owner has abused the chassis more than he had any right to. Owners will always abuse their cars if they have too much motor power. But the public does not know the cause of the trouble. They say that other cars do not have similar troubles. True, they do not, and why? The answer is brief: There is not enough motor power to abuse the other parts. Enough is much better than too much. Where there is a surplus it means higher cost in upkeep and quicker depreciation.

The automobile is a mathematical quantity. It is an equation. To the left of the equality sign is the power-generating portion of the machine; to the right of this equality sign are the parts that transmit the motor power and carry the body. There must be a balance between the two. It is useless to design the motor without a thought of the other parts and *vice versa*. The competent engineer, the one who will continue, the one whose car will be the car of the future, is he who recognizes the engineering equation in design and construction.

* * *

The Voice of the People

MORE and more is the voice of the people controlling. Legislators have had their day; they have passed their favorite laws which have not been for the general good of the industry; they have won their fights with their constituents; they have won their fights in the Legislatures and in the Senates, but generally after they have won the people have awakened to the error of the legislation. The same people who once were led as sheep to the slaughter are now standing up as real soldiers in demanding their rights. The attitude of New Jersey last year stands out conspicuously, but today the other side of the picture is being seen. The public is demanding reciprocity of non-resident privileges in the state. It has discovered that it is worth while to have tourist parties pass through the state, even if they do destroy the roads to some extent. What the New Jersey public is now asking for in the matter of reciprocity of non-resident license privileges has been brought about by the experience of a year. Some of the legislators have discovered that they cannot drive the populace. You cannot compel them to use your roads even if they are the best in the section.

The will of the people is beginning to show itself in many other ways. A strong spirit is developing in the West against the exclusion of automobiles from the Yellowstone National Park. This spirit of opposition has developed chiefly within the last year since the use of motor buses has been taken up by the concern having the privilege of operating stages within the park. The old argument that motor vehicles render the park unsafe for general use has now been exploded and there will be no rest until its driveways are opened to the rational use of the automobile. It is true that special laws will have to be framed governing the use of the automobile over the park drives. In some cases it will be necessary to allow vehicles to go one direction only, because of the narrow

roads. This is not any difficulty, however, as it is being done in thickly congested portions of many of our largest cities. The main fact remains that if the roads are safe for the use of motor buses operated by an individual corporation then they are also safe for the use of the general public.

The prohibition of motor vehicles from the Yosemite Valley in California is also a restriction against which the voice of the people is raised at the present time. The automobile has been excluded from this park because of danger due to the roads. But while horse coaches are allowed they meet with accidents and there is no reason for the exclusion of the motor vehicle solely because of the possibility of accident. Control the vehicles and a satisfactory result will be obtained.

Bill to Brand Dates on Tires

Makers Point Out That a Few Months on the Shelf Takes Little Life Out of Them

THE tire-dating bill has bobbed up again, this time in the New York Legislature. So far, measures of this character have had a rather rocky road to travel, finding stumbling blocks in committee and afterward, but an active effort is being made to get the New York bill reported out of committee with some degree of promptness. The bill was introduced in the lower house by Lewis S. Chanler and was sent to the committee on General Laws.

On February 14 an identical bill was introduced in the Senate by Senator Roosevelt, which reads as follows.

AN ACT to amend the General Business Law, in relation to the manufacture and sale of tires for motor vehicles.

Section 1. Chapter twenty-five of the laws of nineteen hundred and nine, entitled "An act relating to general business, constituting chapter twenty of the consolidated laws," is hereby amended by inserting therein a new section to be section three hundred and ninety-four-a—to read as follows:

X 394-a. MOTOR VEHICLE TIRES TO BE DATED. No person or corporation shall manufacture, sell, offer or expose for sale in this state a tire for use on a motor vehicle, unless the date when such tire was manufactured shall be impressed or branded upon the material whereof such tire is constructed, or otherwise indicated by label securely attached thereto. Every person or corporation violating this section shall be liable to a penalty of fifty dollars for every tire manufactured, sold, offered or exposed for sale in violation thereof, recoverable in a civil action by any person who will sue for the same, one-half whereof shall be paid to the state treasurer. Such penalties shall be cumulative and more than one penalty may be recovered in the same action by the same person in any court of competent jurisdiction.

X 2. This act shall take effect January first, nineteen hundred and thirteen.

The tire makers point out that while it is undoubtedly true that if tires are exposed to light, oil and moisture they will deteriorate with the passage of time, that it is also true that if the tires are carefully packed and protected, a few months on the shelf at one of the depots will not serve to take any material amount of life from the tire.

They also state that the consumer nowadays buys miles when he purchases tires and that they stand behind their product no matter if it is necessary to store it for a few months.

The history of tire-dating laws commences with the enactment of a branding law in Minnesota, some time ago. This law at present is inoperative because the Attorney-General of Minnesota has decided that it would be impossible to enforce its provisions.

Four-Wheel Drive in Army Test

WASHINGTON, D. C., Feb. 19.—Through an unfortunate error, the fact that a Four-Wheel Drive car owned by the government, was participating in the army test between Washington and Fort Benjamin Harrison, Ind., was not mentioned in last week's issue. The Four-Wheel Drive machine started with the White and Sampson trucks, also government-owned cars.

Excluding the motor vehicle from these two national pleasure grounds is today a big loss to the industry. It is questionable if there can be found any three physical attractions in America which offer more inducement to the tourist than the Grand Cañon of the Colorado, Yellowstone National Park and the Yosemite Valley. It would pay the motoring interests to raise the ban of prohibition on two of them and get roads by which tourists can go to all three of them from the East. There are over two hundred millions of dollars spent annually by American tourists in Europe. There is no reason why a great many of these tourists cannot be directed to these great pleasure grounds of the West. Much can be accomplished in this way by opening them to motor vehicle use and building the highways.

A. C. A. Tilt Put Off a Month

Peacemakers Offer Compromise Resolution Which Puts Matter in Hands of Special Committee

THE pitched battle scheduled to take place between the old guard and insurgents of the Automobile Club of America on Monday night failed to materialize and truce was declared for a month. In the meantime, however, both sides will await with interest the rendition of a report by a committee on arbitration to which the matter at issue was referred.

The trouble at the club arose over the fact that some of the members thought they saw an attempt to form a permanent oligarchy on the part of the present administration, the attempt being illustrated by the tenor of a series of constitutional changes proposed for enactment at the annual meeting. The chief point about these proposed changes was the legalization of voting by proxy.

Monday night almost 600 members of the club gathered to do battle on the proposition, but before the skirmishers were engaged, President Sanderson through John C. Milburn, counsel of the organization, presented a compromise suggestion in the shape of a resolution that the whole matter be referred to a special committee composed of two regulars, two insurgents and five neutrals. There was some sharp debating on the resolution, which was eventually adopted.

The neutral faction on the committee is composed of: Henry W. Taft, Clarence H. Mackay, Robert Bacon, Theodore N. Vail and August Belmont. The other factions will be named at once.

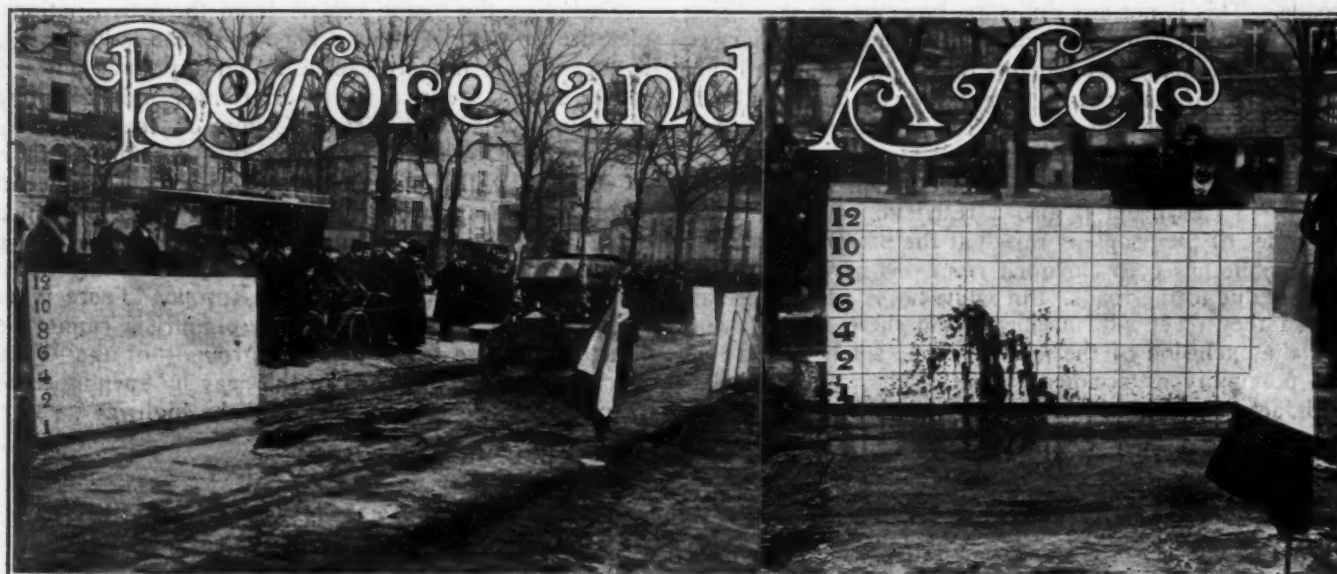
Further consideration of the dispute has been postponed until March 19, but the committee must do its work before that time, for the instructions given the committee provide that notice of its findings shall be mailed to all the members by March 12.

As a result of the troubles at the club, Charles E. Fosdick, who has acted as secretary of the organization since he succeeded Samuel M. Butler in that position about 2 years ago, has resigned.

Mr. Fosdick sided with the insurgents when the campaign first opened, and President Sanderson recently ordered him to secure desk room outside of the club. About a week ago matters came to a crisis and at the meeting last Monday, Mr. Fosdick's formal resignation was presented and accepted.

Rigid License Law for Quakers

YORK, PA., Feb. 19.—Highway Commissioner E. M. Bigelow to-day issued orders that the provisions of the automobile license act requiring persons operating motor vehicles to be licensed would be enforced. This will mean that all persons who operate trucks or cars, even though they perform such duty part of a day, or as a part of their regular work, must be licensed.



Measuring the degree of splash—coming down to the scoreboard

A bad performance

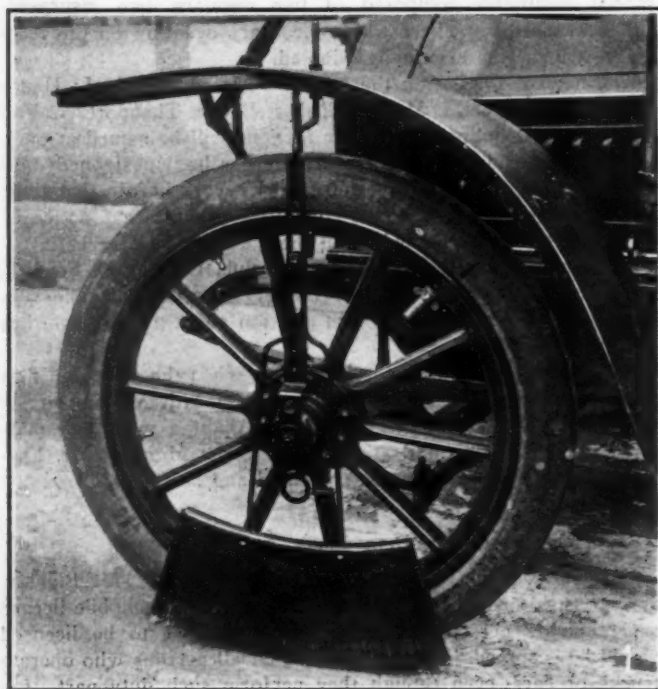
Minimizing the Mud-Splashing Nuisance

Parisians Promote a Contest to Bring Out Devices to Protect the Clothing of Pedestrians

PARIS, Feb. 12—French municipal and automobile authorities being considerably interested in the production of an apparatus capable of preventing lateral splashing of mud from the wheels of motor vehicles, the competition organized by the Automobile Club of Seine and Oise, at Versailles, called together twenty of the contestants for the honors. The

guards were all fitted to the wheels of cars and given the test over a specially prepared mud track. On each side of the band of mud were placed at regular intervals large white boards divided into squares by horizontal and vertical lines. The cars were sent over the track in two directions at a minimum speed of 15 miles an hour, and immediately after their passage count was made of the number of squares splashed with mud. Later, the appliances were examined by the jury with a view to easy fitting, method of cleaning them, general appearance, and finally were made to come in close contact with the edges of sidewalks.

About half of those under test were manifestly inefficient; they allowed mud to scatter to left and right, to front and rear; they were complicated in their attachment, and they were often costly to produce. There were two general classes: splash guards formed of such material as leather, rubber, canvas, chain mail or brush material hanging from the hub cap and maintained in the correct position by springs or other attachments. It is the latter type of splash guard which has been adopted by the Paris General Omnibus Company, but which has failed to give satisfaction by reason of its tendency to revolve with the wheel. In the opinion of the competition jury, however, it was the most suitable all-round type, for the first eight awards went to this class of splasher. The winning apparatus was the Dreux, a leather-bound brush hanging from the hub cap by means of a suitable stay, with a couple of coil springs to prevent it being carried round with the wheel, and the stay itself passed through the mudguard in order to give greater rigidity. The Gruyelle, which won second prize, was similar in principle, but differed in the method of attachment. It consisted of a brush hanging from the extremity of a horse-shoe stay secured to the hub cap and the steering pivot (in the case of a front wheel). Its best feature was the excellent mounting to the hub cap, and the provision made for keeping out dirt and keeping in oil. In the Neron-Bristol, which was



1—The Dreux device, which captured first prize

classed third, the guard was made entirely of leather and was also hung from the hub cap. A suitable disk was mounted on the cap and engaged in a groove on the inner face of a ring with a descending arm to which the splasher was hooked. Its own weight kept it in the correct position. In the fourth apparatus a horizontal bar was mounted on the outer face of the hub cap, and from this descended two vertical members connected to a second and parallel horizontal bar, to which the leather splash guard was loosely pivoted at two points, with a coil spring to arrest fore-and-aft movements.

A second class of apparatus consisted of disks of leather, rubber or rubber and canvas the same diameter as the wheel, and mounted on the outer face of the wheel at a suitable distance from the latter. One of the best known of these was the Menu, constructed of the casings of old tires, thus being moulded to the correct profile of the tire and in no way altering the appearance of the car. In some cases these disks of rubber or leather were attached close to the tire or the rim, a mounting which did not improve their efficiency, for with no space for the mud to fall it was flung over the top of the guard. In some cases, too, the attachment was defective, the splash guards being shed before they had reached the end of the rough track.

One maker secured efficiency by completely incasing the wheels of his car with a sheet-metal housing, thus making it unnecessary to carry the ordinary mudguards. Although he went by without leaving a speck of mud on the indicator boards, he failed to win a prize. Another apparatus was composed of a chain-mail frill right around each wheel, giving the appearance of an old-fashioned tire guard. This too failed to convince the jury. Still another was composed of strips of rubber, about 3 inches in width, with metal weights on their ends, hanging diagonally from a board carried in a fore-and-aft direction on the outside of each wheel.

In designing their splash guards many of the inventors had apparently overlooked the fact that they were not necessary for the comfort of motorists, and therefore had little chance of being adopted unless they were low in price and easy of attachment. While \$16 was not an exorbitant price, it was difficult to believe many private owners would be willing to pay the \$100 asked for some of the sets, and certainly no taxicab company or commercial vehicle company would do so.

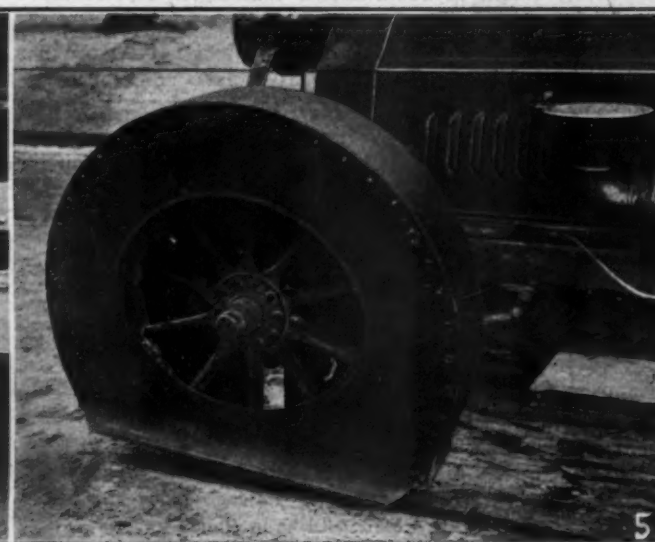
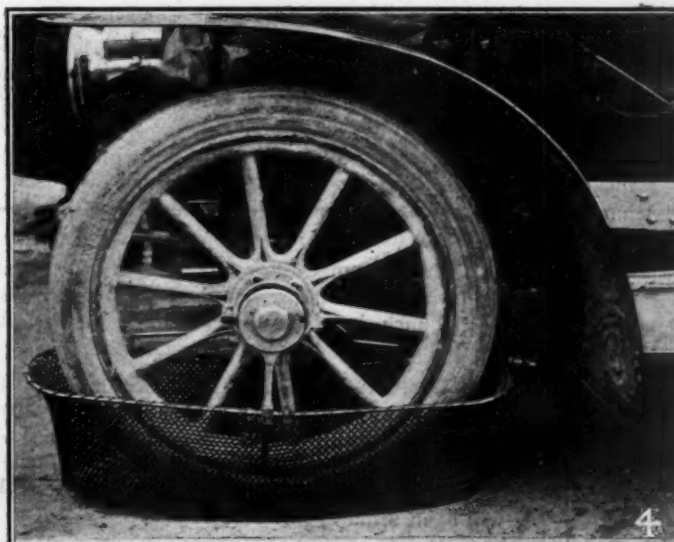
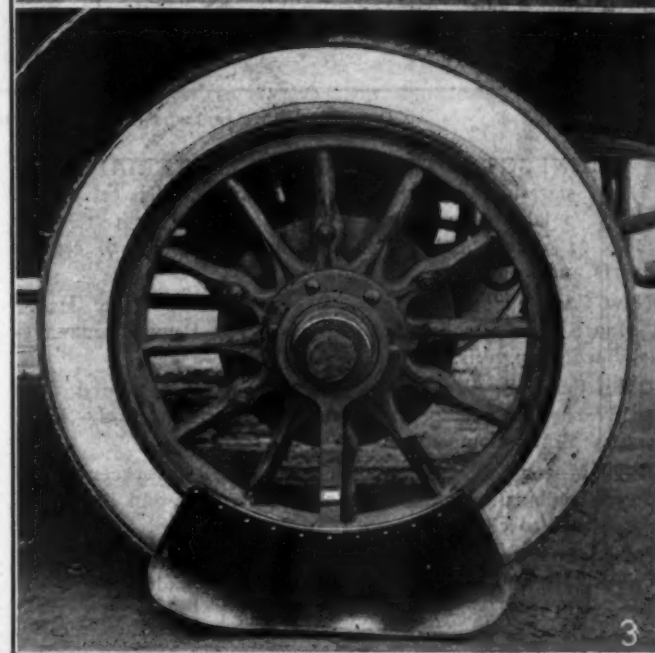
It was shown that a simple piece of leather, rubber or brush material hanging from the hub cap was quite sufficient to provide protection for foot passengers, providing the guard could be made to hang vertically.

2—The Gruyelle protector, which finished second

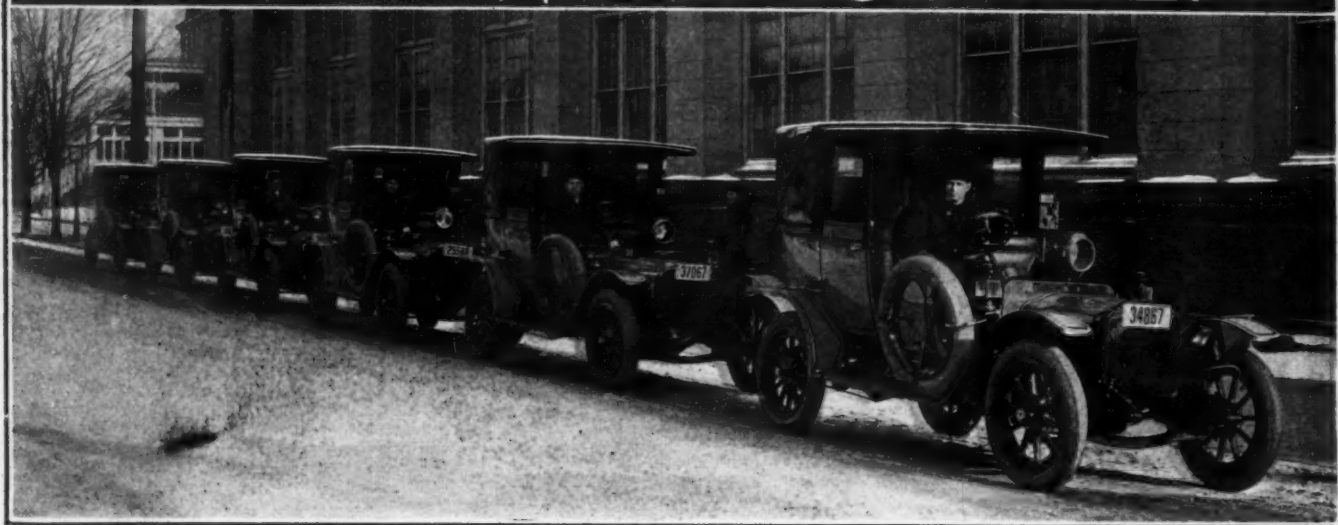
3—The Neron-Bristol, third, was made of leather

4—Julius Pinçon's device was a wheel-skirt

5—Moraud entry had clean score, but was ruled out



NEWS of the WEEK CONDENSED



Group of White taxicabs now being operated by the Cleveland Taxicab Company

MINNESOTA TESTS ROAD MATERIALS—The state highway commission of Minnesota has established a laboratory equipped with machinery for testing the quality of cement and gravel used in construction of cement culverts and bridges.

New Garage at Sheboygan—George Bessinger and Harry B. Moore have established a garage at 827 Pennsylvania avenue, Sheboygan, Wis.

Cobb Succeeds Warner—A. M. Cobb has succeeded Gaylord Warner as manager of the Chicago branch of the E. R. Thomas Motor Company.

Buys Motor Fire Wagon—Eugene, Ore., has recently ordered a combination automobile chemical engine and hook-and-ladder truck to cost \$7,920.

Handles Four Cars—The Johnson-Fortnum Machine Works, Berlin, Wis., agent for the Reo, has added the Kissel Kar, Buick and Regal lines.

Bunker Gets Olds—Homer W. Bunker has closed with the Olds Motor Works as Southwestern Washington representative with headquarters in Tacoma.

Wells Again with Thomas—Edward Wells of Boston has been re-engaged by the E. R. Thomas Motor Car Company, at Buffalo, as assistant sales manager of the factory.

Jackson Seeks Site—E. W. Jackson, of the Jackson Engineering Company, of Wilkes-Barre, Pa., is seeking a location for a factory to build a 1-ton truck which he has designed.

Root to Sell Trucks—C. P. Root, of Portland, Ore., manager of the Michigan Motors Company, has secured the Northwest agency for the Lippard-Stewart light delivery wagon.

Opens Salesrooms—The General Motors Truck Company, Boston, Mass., has arranged to open salesrooms for its electric department on Boylston street, with J. E. Baker in charge.

Kenosha Club Organized—The Kenosha Automobile Club was organized at Kenosha, Wis., with a charter membership of fifty-four and 100 more in prospect before the charter closes.

Kellogg Opens Chicago Office—The Kellogg Manufacturing Company has recently opened a Chicago office at 1108 S. Michigan avenue. E. B. Reeser will be in charge.

Motor Cars in Mine—The Sloss-Sheffield Steel & Iron Company, of Birmingham, Ala., has replaced 12 mules in mine No. 2, Dorá, by motor-driven cars. Other installations will follow.

Gwinn Company Organized—The Gwinn Sales Company of Columbus, O., has been organized by O. E. Gwinn and others to act as sales agent for the Davis 45 and the Alpena cars in Central Ohio.

Two New San Diego Agencies—The U. S. Grant Hotel Garage, of San Diego, Cal., has taken the agency for the Halladay car. The I. X. L. Garage has secured the agency for the Cartercar in San Diego county.

Cartercar's New Agent—The Capitol Cartercar Company has been organized in Lincoln, Neb., and is composed of A. E. Anderson, A. E. Kull, and L. S. Lillibridge. The company will handle the Cartercar, at 1121 P street.

Wilson to Succeed Bayerline—Lucius E. Wilson, secretary of the Detroit Board of Commerce, has offered his resignation, to take effect April 1, when he will succeed J. G. Bayerline as general manager of the Warren Motor Car Company.

Parker Moves to Fulton—The Parker Transmission Appliance Company, of Springfield, Mass., is preparing to move to Fulton, N. Y. The company makes a device for doing away with friction between automobile gears.

Goodwin Leaves Minneapolis—Harvey Goodwin, recently manager of the Stromberg Motor Devices Company, will leave Minneapolis February 24 to engage in the sale of Hudson cars with the San Francisco agency.

Automobiles on the Potomac—For the first time in the history of the Potomac River it has served as a speedway for automobiles. The 18-inch ice recently tempted a number of Washington automobilists to hold impromptu races on the river.

Twin City 'Bus System—The Twin City Motor Transit Company, has bought sixteen Atterbury motor 'buses for use in interurban service to begin April 1. The cars will seat sixteen, have cross seats, pay-as-you-enter entrance, heating facilities and electric lights. The company's offices are in St. Paul and its garage will be in Minneapolis.

Lytle Takes R. C. H.—J. W. Lytle, located on Third street, Urichsville, O., has taken the agency for the R. C. H.

Garage Changes Hands—The Sanborn Garage, Concord, N. H., has been purchased by E. M. Hobbs and M. J. Buckley.

Munson to Leave Gray & Davis—Charles Munson, Western sales manager for Gray & Davis, Amesbury, Mass., has resigned.

Gage Gets Overland—The Gage Auto Company, 160 W. Main street, Logan, O., has taken the agency for the Overland.

Stebbins Eastern Manager—H. S. Stebbins, of the General Motor Truck Company, has been assigned to New York as Eastern district manager.

Detroit in Frisco—Carl Christensen has taken the agency for the Detroit; temporary quarters will be taken with the C. & F. Motor Car Company.

Mehrten Leases Garage—R. M. Mehrten has leased the Matson garage at Sykesville, Pa., and will conduct the business under the name of the Mehrten Garage.

Ford in Canada—A separate Canadian charter has been taken out for the Ford Motor Company's business in Canada. Head offices will be at Sandwich, Ont.

Sawyer Opens Shop—The Sawyer Auto Specialty Company, Columbus, O., has opened an automobile repair and refinishing shop at 43 E. Lafayette street.

Everett Gets Adams Agency—The Everett Motor Car Company, of Everett, Wash., has taken on the agency for Adams trucks for the state of Washington.

Transfer Company Sold—The Hamilton Automobile Transfer Company, of Lisbon, O., which has been operated by Hamilton Brothers, has been sold to Clarence C. Smith.

White to Represent Pullman—E. F. White has joined the forces of the Pullman Motor Car Company as factory representative. He will cover the Middle West and South.

Peden to Distribute Westcott—The Peden Iron Steel Company, Houston, Tex., has organized an automobile department and will distribute the Westcott car throughout Texas.

May Buy Fire Trucks—The common council of Eau Claire, Wis., is considering the purchase of three motor fire trucks. The committee in charge is headed by mayor J. T. Fleming.

Pilot Has Chicago Branch—The Pilot Motor Car Company, Richmond, Ind., is now represented in Chicago by the Pilot Motor Sales Company, 1716 Michigan avenue, of which E. D. Webster is manager.

Goodyear Branch Burns—The Detroit Branch of the Good-

year Tire & Rubber Company, 251 Jefferson avenue, was burned out last week. The company's loss of \$100,000 was practically covered by insurance.

New Quarters for Heilman—Another Cincinnati auto concern to establish itself in new and better quarters is the Heilman Company, which yesterday took possession of a new location at Blue Rock and Hamilton avenues.

Carlson Succeeds Goodwin—Walter T. Carlson has been appointed manager of the Northwestern branch of the Stromberg Motor Devices Company, 1514 Hennepin avenue, Minneapolis, Minn., in the place of Harvey Goodwin, who resigned recently.

Standish Buys Garage—The garage and repair shop at 61 E. Spring street, Columbus, O., which was formerly operated under the name of the Central Ohio Auto & Garage Company, has been taken over by E. A. Standish & Company, and will be continued in the same location.

Hotel Men to Promote Touring—The Empire Tours Association was incorporated last Thursday in Albany, Proctor C. Welch, manager of The Onondaga hotel, Syracuse, N. Y., being secretary and a member of the board of directors. The organization consists of 125 hotel men in the state banded to promote automobile touring.

Want Motor Fire Apparatus—Mayor Daniel W. Badger and chief engineer John D. Randall, of the fire department at Portsmouth, N. H., have recommended to the city council that it take steps at once to purchase a motor chemical and hose wagon for the better protection of property. It is expected that the city council will act favorably upon the matter at its next meeting.

Motors Replace Locomotives—Motor cars are to play important parts on two railroads in New Orleans territory in the near future. The Ellisville branch of the New Orleans, Mobile and Chicago railway, where the traffic does not justify the use of the entire equipment of a regular steam service is to be operated with motor cars. The Grand Island Railway has also decided to replace the steam equipment with motor cars.

New Havers Agents—Sanderson & Burkhardt, Buffalo, N. Y., have appointed the following sub-agents for the Havers car: R. H. Ives & Company, Binghamton, N. Y.; Lewis Sands, Albion, N. Y.; A. Bussault, Lockport, N. Y.; N. V. Healey, Fredonia, N. Y.; J. Cunningham, Rochester, N. Y. The following agents have been appointed by the Havers company: Winnipeg Garage, Ltd., Winnipeg, Man.; Coleman Brothers & Dillon, Sedalia, Mo.; H. M. Andrews & Company, Elyria, O.; B. A. & R. Cunningham, Hackensack, N. J.



New service building for Chicago's Rambler contingent at Indiana avenue and Twenty-third street

Snyder Takes Flanders—The Snyder Auto Company, 229 W. Market street, York, Pa., has taken the agency for Flanders.

Parker Gets Staver—The Staver is now represented in Boston by F. R. Parker, who handles the Brush for New England.

Westcott in Brookline—The Harris Motor Car Company, Brookline, Mass., has taken the agency for Westcott cars in this territory.

Bronze Company Changes Name—The Comstock-Wellman Bronze Company, Cleveland, O., has changed its name to the Wellman Bronze Company.

Woman Chosen President—The Concord, N. H., Automobile Club has elected Miss Esther J. Reynolds president and Miss Mildred Hodgman secretary and treasurer.

Mattoon to Sell Trucks—R. S. Mattoon has taken the agency of the Indiana truck manufactured by the Harwood-Barley Manufacturing Company, for Chicago and vicinity.

Galveston Wants Plant—In the hope of securing an automobile factory, Galveston, Tex., is offering a free site through the secretary of the Galveston Commercial Association, J. E. Kaufman.

Borget Leaves Beaver Company—A. J. Borget, for some time past purchasing agent of the Beaver Manufacturing Company, of Milwaukee, Wis., has severed his connection with the Beaver company.

Wright Buys Parker Plant—The Henry Wright Manufacturing Company, Hartford, Conn., maker of sensitive and radial drilling machines, has purchased the plant of the Parker Motor Company.

Service Depot for Stutz—The Empire Motor Car Company, Boston agent for the Stutz and Empire cars, has leased a building on Bickerstaff street where it will open a service depot and garage in charge of a factory man.

Bailey Leaves Horseless Age—Charles E. Bailey has resigned from the advertising staff of *The Horseless Age* to take the position of advertising and sales manager of the Republic Motor Car Company, Hamilton, O.

Uptown Branch of M. C. E. Company—The Motor Car Equipment Company, 55 Warren street, New York City, has opened an uptown branch at 238-240 W. Fifty-sixth street. The branch has a floor space of 10,000 square feet.

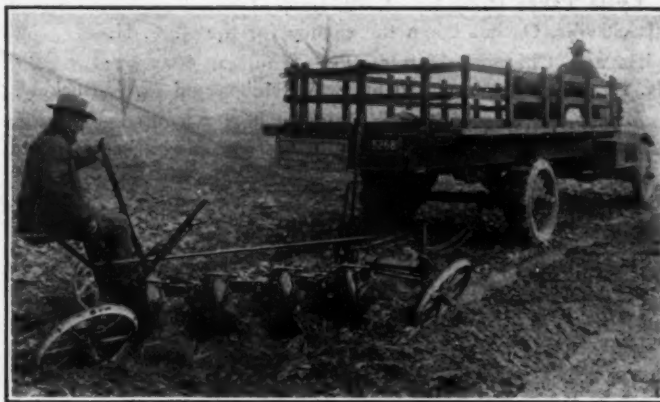
Sargo Succeeds Hoffnung—The Sarco Engineering Company has succeeded S. Hoffnung & Company, Ltd., at 116 Broad street, New York, as exclusive American agents for the Coventry Chain Company, Ltd., White & Poppe, Ltd., and Fastnut, Ltd.

Veerac Trucks in St. Paul—G. E. Holmes and A. B. Curry have formed the Veerac Sales Company and have taken the agency for the Veerac Motor Company, which makes light trucks. The company has taken a garage at 1790 University avenue, St. Paul.

French Resigns—The resignation of Lucius S. French as advertising manager and assistant secretary of the Henderson Motor Sales Company has been announced. Mr. French will go to Portland, Ore., where he will become advertising manager for the Eiler Piano Company.

Buy P. H. P. Business—The business of the P. H. P. Motor Truck Company, Westfield, Mass., has been bought by W. S. Magill, G. Osborne and I. P. Miller, of New York City, who will continue the business under the name of the Westfield Motor Truck Company. The present factory building will be altered.

Ford Adds Wisconsin Agencies—Vautrot Brothers, Durand, Wis., have taken the agency for the Ford car and have opened a garage and showroom. Ford agencies have also been placed with Colfax Store Company, Colfax, Wis.; Kraft Merchandise Company, Menomonie, Wis., and Mondovi Hardware Company, Mondovi, Wis.



Plowing with a 3-ton KieselKar truck at Visalia, Cal.

Brodesser Branch Expands—The Milwaukee, Wis., sales department of the Brodesser Motor Truck Company, Juneau, Wis., has taken over the sales interests of the Menominee commercial cars, manufactured by the D. F. Poyer Company, Menominee, Mich. The Poyer company is turning out two trucks weekly and is making arrangements to increase its capacity to one car daily.

De Tamble Agents Appointed—The De Tamble Sales Company, 244 N. Fourth street, Columbus, O., organized by R. E. Rusk to handle the De Tamble in thirty counties in Central Ohio, has contracted for the following sub-agents: The Hebron Garage Company, Hebron, O.; Dwight Walker, Lancaster, O.; Mark Elsey, Marion, O.; Dr. Putnam, Mt. Vernon, O.; Cheney & Mummaw, Coshocton, O.

Minneapolis Notes—The Hudson & Thurber Company has taken the agency for the Cutting car along with the Speedwell and Bergdoll. The Woods electric is now handled by the MacArthur-Zollars-Thompson Company. The Tri-State Automobile Company has taken the territory for the Marathon line. The Eagle Motor Works has taken the agency for the Metz cars in the Northwest. The Firestone Tire & Rubber company has opened a branch in Minneapolis and George N. Martin, of the St. Louis branch, will be manager. O. Fenstermacher will continue his agency for Firestone tires and inner tubes in that city and the surrounding territory.

Northwall Appoints Agents—The T. G. Northwall Company, of Omaha, Neb., has closed contracts for Brush, Detroit, and Courier-Clermont cars with the following: Van Beck & Everhart, Hancock, Ia.; Galva Auto Company, Galva, Ia.; Elmer Orris Company, Winterset, Ia.; Irwin Auto Company, Jefferson, Ia.; J. C. Jordan, Gordon, Neb.; Waples & Son, Castana, Ia.; F. C. Webb, Guthrie Center, Ia.; G. F. Litchey, Des Moines, Ia.; F. W. Wilmerding, Earlring, Ia.; F. W. Bean, Yorkshire, Ia.; O. K. Jones, Lexington, Neb.; Tabor Mercantile Company, Tabor, S. D.; Wattson & Lockwood, Chamberlain, S. D.; Jay Welsh, Geddes, S. D.; and the Fremont Implement Company, Fremont, Neb.

New Abbott-Detroit Agents—Among the many concerns reporting new dealers in the Middle West, the Abbott Motor Company, of Detroit, has appointed the following: W. L. Huffman Automobile Company, Omaha, Neb., and Sioux City, Ia.; Tremain & Rankin Auto Company, Fort Dodge, Ia.; Totten Automobile Company, Rock Island, Ill.; Tjaden Auto Company, Wellsburg, Ia.; Robertson Motor Car Company, Minneapolis, Minn.; Kaw Valley Automobile Company, Kansas City, Mo.; M. M. Baker & Company, Peoria, Ill.; Johnston Motors Company, Des Moines, Ia.; J. W. McKay, Grafton, N. D.; Oskaloosa Vehicle & Auto Company, Oskaloosa, Ia.; Burney Bird Auto Company, St. Paul, Minn.; Fischer Motor Car Company, Quincy, Ill.; A. F. Schrup & Company, Dubuque, Ia.; Barclay-Morton Auto Company, Mason City, Ia., and Bates-Odenbrett Auto Company, Milwaukee, Wis.

Bergdoll in Atlanta—The Atlanta Top & Trimming Company, Atlanta, Ga., has taken the agency for the Bergdoll.

Join Alco Forces—W. F. Winkelman and L. F. Johnson have been appointed traveling sales representatives of the Alco.

Mitchell in Everett—The Riverside Carriage Company, of Everett, Wash., is the latest to be added to the Northwest distributors of Mitchell cars.

Mayor Starts 'Bus Service—Mayor Joseph Versailles of East Montreal has instituted motor 'bus service between his municipality and Montreal proper.

To Sell Electrics—The Ralph E. Brown Motor Car Company, 1030 Main street, Buffalo, N. Y., has opened an agency for the sale of Rauch & Lang electric cars.

Benkelman's New Garage—The Midwest Auto Company has opened a garage in Benkelman, Neb., the proprietors being Kelly & Evans. They will handle E-M-F and Flanders cars.

To Replace Fire Horses—Mayor Goodman of Racine, Wis., has sent a message to the common council urging the immediate purchase of three motor fire engines to replace all horsedrawn steamers.

Another Quaker Club—Before summer rolls around Philadelphia will have another motoring organization added to its list, plans now being under way to form the Old York Road Automobile Club.

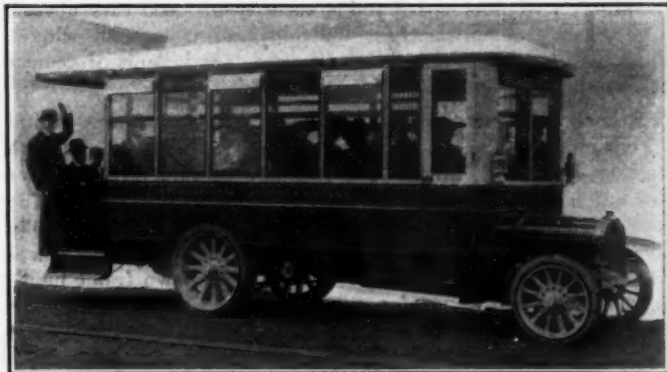
To Build Service Station—The G. E. & H. J. Habich Company, Boston, Mass., agents for the Cole car, will erect a new building on Bickerstaff street, to be used as a service department and garage. It will be 80 feet by 100 feet and two sides will be all windows.

Two More Branches in Atlanta—Atlanta will soon have two more branch houses. The Locomobile Company will close for new showrooms and a service department. The Oakland Motor Company has already closed for showrooms at 141 Peachtree street and a service department at 26 James street.

To Make Automobile Tools—The Anheuser File & Tool Company is being organized in Racine, Wis., with a capital stock of \$15,000 to succeed to the business of the Anheuser File Company. The buildings will be considerably enlarged and new equipment installed. The company will specialize in files and tools for motorists.

Officers and Directors Elected—The Waverly Motor Company, Jefferson, Wis., has elected the following directors and officers: president, C. W. Mack; vice-president, F. P. Henning; secretary and treasurer, Albert F. Haberman. The plant is now in operation and working to capacity. The product will be motors and motorcycles.

Horst & Strieter to Open—The Horst & Strieter Company, Rock Island, Ill., has moved into its new \$40,000 building, and will hold a formal opening Saturday, February 24. The new company is the agent for the General Motors Company trucks and tri-city agents for the Moline, with Scott county, Ia., and Rock Island county, Ill., as territory.



'Bus built by J. G. Brill Company on a Saurer chassis

Milwaukee Show Plans—The Milwaukee Automobile Dealers' Association has tentatively decided to hold its 1913 show in the Milwaukee Auditorium from January 11 to 27, thus making a 2 weeks' exposition in place of the usual 1 week show. The first part is to be devoted to pleasure cars and accessories and the last week to commercial vehicles.

Automobile Incorporations

AUTOMOBILES AND PARTS

BROOKLYN, N. Y.—J. Barth Cronin Corporation; capital, \$500; to do a general automobile business. Incorporators: J. B. Cronin, P. A. Hasty, J. H. Duncan.

CHICAGO, ILL.—Eyles Auto Wheel Company; capital, \$2,000; to make wheels for automobiles. Incorporators: G. A. Chritten, J. H. Lee, R. A. Raymond.

CLYDE, O.—Krebs Commercial Car Company; capital, \$100,000; to manufacture and sell trucks, pleasure cars and accessories. Incorporators: J. C. L. Krebs, R. A. Becker, F. X. Bachle, H. Metzger, G. Slesman.

DETROIT, MICH.—Automobile Forgings Company; capital, \$100,000; to make automobile parts. Incorporators: G. W. Strelinger, D. E. Van Derver.

DETROIT, MICH.—Motor Truck Body Company; capital, \$10,000; to make truck bodies and parts. Incorporators: E. T. Hangsterfer, F. G. Proctor, E. F. Rauss.

FORT WAYNE, IND.—Fort Wayne Auburn Auto Company; capital, \$20,000; to make and sell automobiles. Incorporators: J. M. Corner, H. C. Hoodelmire, E. C. Walker.

FRANKFORT, KY.—Nicol Motor Car Company; capital, \$1,000; to sell automobiles. Incorporators: R. C. Nicol, J. W. Nicol, W. D. Nicol.

INDIANAPOLIS, IND.—N. S. W. Motors Company; capital, \$60,000; to make automobile parts. Incorporators: C. Nesom, L. Sagalowsky, F. W. Wellman.

INDIANAPOLIS, IND.—Oakes Manufacturing Company; capital, \$10,000; to manufacture parts for automobiles. Incorporators: W. D. Oakes, W. H. Oakes, C. P. Oakes.

JERSEY CITY, N. J.—Whitmore Auto-Gear Composition Sales Company; capital, \$100,000; to conduct a general automobile business. Incorporators: B. S. Mantz, J. R. Turner, L. H. Gunther.

NEWARK, N. J.—Kaplan Auto Supply Company; capital, \$25,000; to do a general automobile business. Incorporators: A. Kaplan, T. A. Kaplan, L. Umstaetter.

NEW YORK CITY—Bidwell-Conklin Corporation; capital, \$5,000; to sell automobiles. Incorporators: H. F. Bidwell, K. Conklin, W. F. Stubner.

NEW YORK CITY—Speedwell Motor Truck & Service Company; capital, \$50,000; to sell and care for trucks. Incorporators: G. A. Fendreich, J. Friedman, J. B. Unicake.

PATERSON, N. J.—Auto Shop Company; capital, \$50,000; to do a general automobile business. Incorporators: W. McKee, F. Beggs, G. F. Wright.

PLAINFIELD, N. J.—Standard Auto & Tire Company; to sell automobiles and supplies. Incorporators: H. P. Voseller, J. H. Slevin, F. Ivamy.

PEEKSKILL, N. Y.—Steinbock Engineering Company; capital, \$1,000,000; to build automobiles. Incorporators: H. E. Steinbock, F. B. Knowlton.

GARAGES AND ACCESSORIES

BALTIMORE, MD.—Taxi-Service & Baggage Corporation; capital, \$150,000; to do a general transportation business.

DAYTON, OHIO—Automobile & General Mutual Insurance Company; to do an automobile insurance business. Incorporators: D. W. Iddings, B. C. Coleman, G. Huffman, J. G. Hamilton, J. A. Hoovdf, R. C. Iddings.

GLOVERSVILLE, N. Y.—Forest Street Garage Company; capital, \$2,000; to do a garage business. Incorporators: S. Y. Stockmore, D. Smith, W. P. Bellinger.

INDIANAPOLIS, IND.—Smart Manufacturing Company; capital, \$10,000; to make automobile accessories. Incorporators: B. Smart, L. B. Willis, J. N. Shelton, J. Cobalt, W. McAdoo, J. F. Cooper, G. Williams.

LAKE MILLS, WIS.—Lake Mills Automobile Company; capital, \$6,000; to sell automobiles and conduct a garage. Incorporators: F. A. Previtz, A. Voe, S. H. Kypke, G. H. Bruns.

CHICAGO, ILL.—Englewood Motor Car Company; capital, \$1,000; to repair automobiles. Incorporators: C. A. Londelius, A. E. Jackson, J. F. Wagner.

NEW YORK CITY—Auto Mercantile Company; capital, \$2,000; to do an automobile credit agency business. Incorporators: M. Stark, L. M. Loewenthal, P. M. Lewis.

NEW YORK CITY—Colonial Rubber Specialties Company; capital, \$10,000; to deal in automobile supplies. Incorporators: G. M. Port, E. P. Aird, S. Newman.

NEW YORK CITY—Hudson City Auto Exchange; capital, \$35,000; to do a general automobile and supply business. Incorporators: G. Lapp, F. W. Lieberknecht, P. Bentley.

NEW YORK CITY—M. M. Automobile Automatic Safety Signal Company; capital, \$50,000; to manufacture an automatic signal device. Incorporators: Maguire & Martin, John C. McGee, W. F. Rawlins, Ira M. Black.

NEW YORK CITY—Alhambra Garage Company; capital, \$10,000; to conduct a garage business. Incorporators: J. C. Graveur, G. W. Kenney, F. L. Kenney.

NEW YORK CITY—Columbia Garage Company; capital, \$1,000; to conduct a garage. Incorporators: H. S. Lyons, V. G. Bogardus, G. S. Aufrecht.

RICHMOND, VA.—Lozier Motor Sales Corporation; capital, \$25,000. Incorporator: W. F. Smith.

PLEASANTVILLE, N. Y.—Pleasantville Garage; capital, \$5,000; to conduct a garage. Incorporators: E. J. Stoughtenburgh, F. B. Van Kleck, Jr.; E. G. Horton.

SYRACUSE, N. Y.—Syracuse Auto Supply Company, Inc.; capital, \$25,000; to manufacture motors, automobiles, etc. Incorporators: E. R. Newhall, C. A. Benjamin, M. C. Klock.

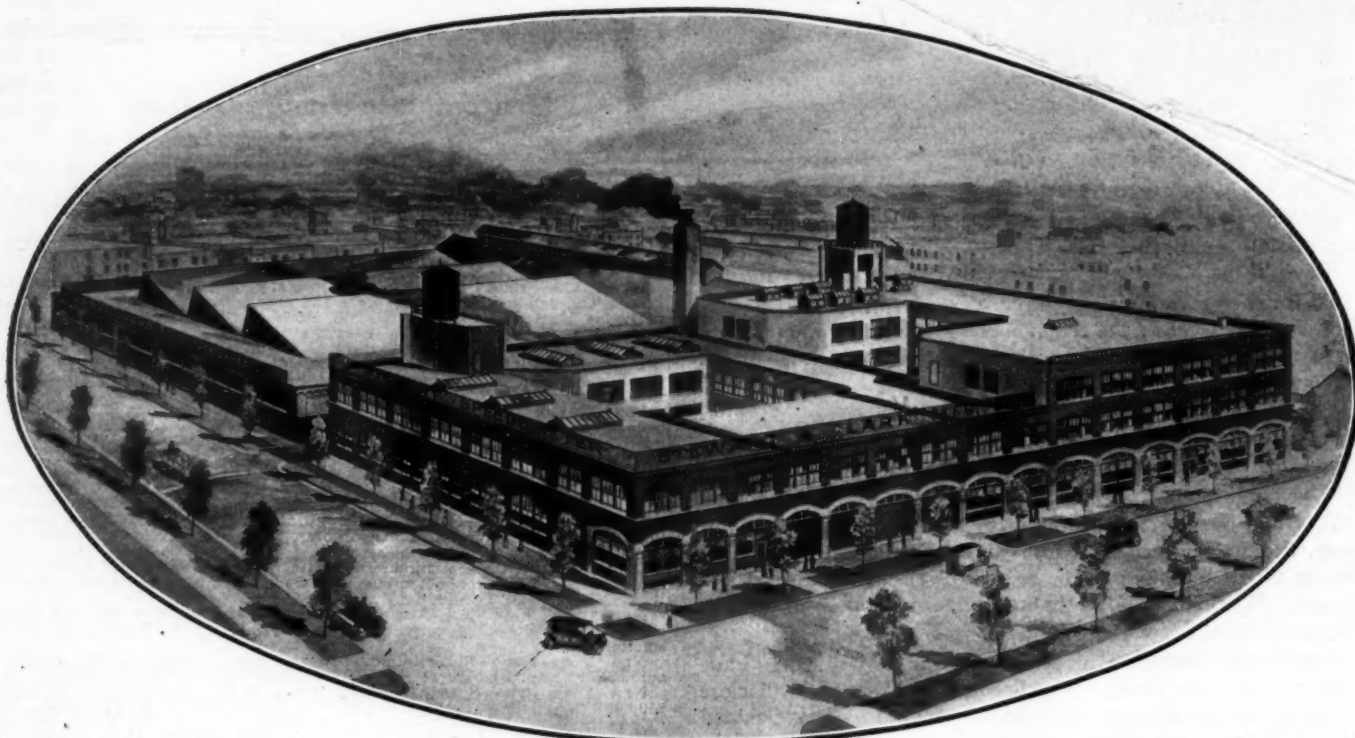
SYRACUSE, N. Y.—Bissell Garage Company; capital, \$10,000; to conduct a garage business. Incorporators: W. H. Bissell, B. Watts, P. Manheim.

WALLINGTON, N. J.—Braender Rubber and Tire Company; capital, \$250,000; to manufacture automobile tires and rubber goods. Incorporators: H. Braender, P. Braender, F. L. Braender, W. P. Braender.

WEST END, N. J.—New Columbia Garage Company; capital, \$10,000; to operate automobile garages. Incorporators: A. J. Seeney, S. C. Fiero, G. Feinberg.

WILMINGTON, DEL.—Leahan Coil Spring Guide Company; capital, \$100,000; to manufacture automobile springs.

OF INTEREST *to the* INDUSTRY



Plant now in process of erection for the Stewart & Clark Manufacturing Company at Chicago

NEW SPEEDOMETER FACTORY—The accompanying illustration gives an idea of the appearance of the new plant of the Stewart & Clark Manufacturing Company, maker of speedometers, when completed. The structure is being constructed at 1828-48 Diversey Boulevard, Chicago, Ill.

Presto-O-Lite in Canada—The Prest-O-Lite Company, Indianapolis, Ind., will open a \$5,000 branch factory in Merriton, Ont., sometime in April.

Dart to Have Eastern Plant—The Dart Manufacturing Company, Waterloo, Ia., maker of light delivery automobile trucks, is contemplating establishing an Eastern plant. Worcester, Mass., is being considered as the site.

To Start March 1—Work on the new plant of the Nyberg Automobile Company, at Chattanooga, Tenn., is already well advanced and it is expected that the building will soon be ready for occupancy so that manufacturing may be begun by March 1.

To Make Motor Trucks—Dr. John G. Barnsdale is establishing a plant for the manufacture of motor trucks at Superior, Wis. He has just closed contracts with several manufacturers of parts for car parts according to his specifications.

Big Blaze in Alliance—The main building of the Tramsue-Williams Company, manufacturer of bicycle, and automobile forgings, was burned out recently with a loss of \$50,000. The structure will be rebuilt at once. The 350 men employed in the building are thrown out of work temporarily.

Detroit in New Plant—The Briggs-Detroit Company, manufacturer of the Detroit, is now occupying its new factory at 475 Holbrook avenue, Detroit, Mich. The structure is of reinforced concrete, 250 feet by 100 feet. It is equipped to turn out 1,000 cars before July 1. The foundation is in for another building of the same size, adjoining the one just completed.

Decatur Company to Move—The \$100,000 stock underwriting required to bring the plant of the Decatur Motor Truck

Company from Decatur, Ind., to Grand Rapids, Mich., has been accomplished. L. W. Coppock, engineer, designer and superintendent of the Decatur company, and M. C. Brackett, general manager, have been looking about Grand Rapids for a location.

Progress on Penn Plant—The work of erecting the buildings for the Penn Motor Car Company's factory at Pittsburgh, Pa., is progressing rapidly. The steel frames for all the buildings are now up, sheeting has been put on several and two are completed, windows having been put in during the past week. Owing to the fact that there was very little brick laying and concrete work to be done, work has been continued on the coldest days of the winter. Machinery is beginning to arrive and it is expected that the plant will be in operation before March 1.

King Company Expands—The King Motor Car Company, 1559 Jefferson avenue, Detroit, Mich., will move to the factory at present occupied by the Hupp Motor Car Company as soon as the latter is installed in its new works, which will be ready about March 1. The move will give the King company 70,000 square feet of floor space and a capacity of 5,000 cars a year. The factory comprises four buildings, all connected, with a frontage of 130 feet on Jefferson avenue. It is built of cement blocks and there is a two-story administration building.

Branch for Detroit—The United States McAdamite Metal Company, Brooklyn, N. Y., has decided to establish a branch factory in Detroit, Mich. The company manufactures castings for automobiles, light marine engines and aeroplane parts. The site purchased in Detroit has a frontage of 350 feet on Isabella avenue at E street. Two spur tracks of the Michigan Central railroad run into the property. There are now two frame buildings, each 50 feet by 100 feet, on the site, in addition to an office building. Work has already been begun on a new brick and steel factory building and foundry, 90 feet by 150 feet. It is expected that the plant will be in operation by April 1, with a force of between 100 and 200 men.

PATENTS GONE TO ISSUE

SILENCER—A valve governing the exhaust of gases from a muffler.

This device, Fig. 1, consists of a valve seat secured to the exhaust pipe of an engine, to which seat is secured a spider. A valve is slidably mounted in the spider, being normally held closely against its seat and an expansion casing; this casing has a dome-shaped top and an exhaust aperture below same.

No. 1,017,536—to Mark Frank Gaydon, Trenton, Ont., Can. Granted, February 13, 1912; filed October 9, 1911.

Carbureter—Designed to vaporize heavy liquid fuels.

The carbureting device, Fig. 2, consists, in addition to a carbureter proper, of a separating chamber and an outlet leading from the same to the engine intake. In this outlet is located a throttle valve. The separating chamber contains deflecting means which direct the oil-air mixture toward the bottom of the chamber; by this process, while the mixture escapes through the throttle passage, the unvaporized particles go into a fuel connection C leading from the lower part of the chamber to the engine intake. On its upward way through the fuel connection the fuel is heated, after which it is injected into the intake means leading to the engine.

No. 1,017,186—to Alfred C. Stewart, Los Angeles, Cal. Granted February 13, 1912; filed February 27, 1911.

Steering-Wheel Lock—By means of which a steering post is held in a given angular position.

This patent refers to a sleeve S adapted to reciprocate on a steering post, Fig. 3, which post may be rotated by means of a wheel. The members of a clutch are carried by the sleeve and the steering wheel, and means are provided for engaging the clutch member on the sleeve with those on the wheel. In this engaged position the clutch members may or may not be locked.

No. 1,017,335—to Theodore D. Stanley, Detroit, Mich. Granted February 13, 1912; filed June 5, 1911.

Tire—Which consists of split rings compressed by springs.

The tire, Fig. 4, comprises a ring, transversely of which split, resilient tire-rings R are located. The lower part of each ring leg is completely inclosed by the rim, and to prevent rotation of the tire within the rim a projection in one engages a recess in the other. The gap between the two ends of the ring is filled by a coiled spring pressing the ring portions together.

No. 1,017,212—to G. Honold and A. Zaehringen, Stuttgart, Germany. Granted February 13, 1912; filed September 6, 1911.

Ignition Mechanism—In which centrifugal force regulates the position of its working elements.

This patent relates to a speed responsive mechanism having a driving and a driven element, to each of which is connected a weighted member. These members are pivoted so as to swing outwardly in consequence of centrifugal force; the pivots are connected by an intermediate member. Thus, the angular position of the elements changes in relation to the speed.

No. 1,017,212—to G. Honold and A. Zaehringen, Stuttgart, Germany, assignors to Robert Bosch, Stuttgart, Germany. Granted February 13, 1912; filed December 17, 1909.

Gearset—A differential containing a web mechanism.

In this construction an equalizing gear unites two shaft portions, it being provided with an L-ring which has an internal web; teeth are formed in this web. The inner shaft portion has teeth which are adapted to engage those of the web, engagement being made by means for longitudinally moving the shaft portion referred to.

No. 1,017,407—to Max H. Grabowsky, Detroit, Mich. Granted February 13, 1912; filed June 21, 1911.

Fluid Clutch—In which a hollow rotor serves as eccentric carrier for pump impeller blades transporting a driving fluid.

This mechanism consists of a cylinder in which a hollow rotor is eccentrically mounted, contacting with the wall at one point. The cylinder has passages each of which opens with the cylinder bore at one of its ends, on opposite sides of the point of contact. The other ends of the passages open through one end of the cylinder, on which end a head is located. This head has a tubular extension into the bore of the rotor as well as chambers communicating with the above-mentioned passages. One of the chambers communicates also with the tubular extension, and the other chamber with the bore of the cylinder, a perforated piston valve controlling the flow into the bore of the rotor. A driving element is connected to the rotor, and a driven one to the cylinder. Radially slidable impeller blades are carried by the clutch rotor.

No. 1,017,216—to Gustave T. Johnson, Chicago, Ill. Granted February 13, 1912; filed June 6, 1911.

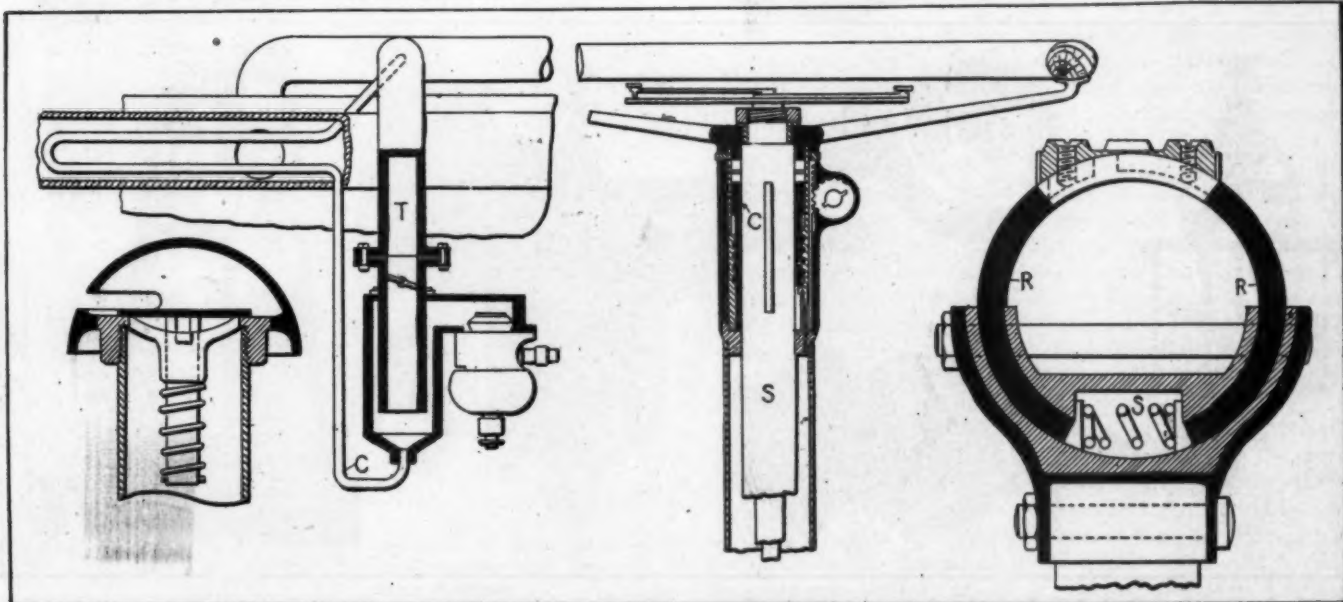


Fig. 1—Gaydon muffler. Fig. 2—Stewart carbureter. Fig. 3—Stanley steering wheel lock. Fig. 4—Seelig tire

Newest Ideas Among the Accessories

Springless Carbureter, Dash-Control Acetylene Illumination, Carbon Remover, Tire Cement

G. & T. Carbureter

THE carbureter, Figs. 1 to 5, is characterized by the absence of springs in its construction. It is entirely automatic in action so that if the throttle is opened and the auxiliary air inlet comes into action the gasoline supply is automatically increased. This feature is explained by reference to Fig. 1, which shows a cross-section of the float-chamber, air valve and gasoline nozzles. There are two gasoline nozzles, a lower one L regulated by the handle H from below and adjusted when the carbureter is fitted to the engine, and an upper one U bearing on a seat in the same casting as that holding the lower needle; the upper needle valve is manipulated by a vertical stem, to which is attached to a horizontal L₁, Fig. 3. This is moved to and fro by the corresponding movement of the auxiliary air-valve cylinder, Fig. 4. As the lug L₁ is moved, it rotates the stem U₁ and raises the needle when the air supply increases but closes the valve when the air is shut off.

The end view of the needle-valve casting is seen in Fig. 5, while the view of the float-chamber, Fig. 2, shows the concentric float F and bowl B into which the casing fits. The needles are arranged eccentrically in the casting, and while the lower needle may be taken out of the casting, the upper one is constantly held in the mixing chamber. The upper needle is adjustable to give a certain proportion of gasoline to air, which is preserved at all speeds. The auxiliary air inlet is shut off by moving the throttle lever connection T away from the carbureter; then the normal air inlet A comes into play. All carbureters made by the Gallagher-Tompkins Company, 1874 Broadway, New York, are water-jacketed.

Prest-O-Liter

This new product of the Prest-O-Lite Company, of Indianapolis, Ind., is shown in Fig. 6, representing a demonstrating model. The tank is connected to the five burners, which represent head, side and tail lights of a car, by means of a valve and four cocks.

The valve is attached to the tank V, while the cocks C₁, C₂, C₃, C₄ are mounted on the dash. The valve governs the outflow of the acetylene from the tank, reducing its high pressure to one of 2 ounces, with which it flows to the burners, where it is ignited by a vibrating spark from a battery and coil created by a button contact B. Opening the first cock C₁, with all the others open admits gas to all burners. If cock C₂ is closed the tail light goes out, while C₃ and C₄ govern the admission of gas to side and head lights respectively. An igniter is centered on each burner, where it readily fires the gas leaving the same. Each burner is located in front of a highly polished reflector and is fitted into the lamp, presenting the same appearance as an ordinary burner. Battery and vibrator are placed at some point of vantage on the car.

Car-Bo-Lide Rejuvenator

A fluid for cleaning the carbon out of the engine cylinders is being marketed under the name of Car-Bo-Lide. This preparation is recommended, by its maker, to be used instead of the conventional kerosene for decarbonizing. The usual process of using this material is to pour two tablespoonfuls into each cylinder through the spark-plug opening, after removing the plug. All the spark-plugs having been replaced in their cylinders the engine is allowed to stand for about 2 hours. During this time the liquid will dissolve the carbon scale inside the combustion-chamber and when the engine is started the impurities will be blown out of the cylinder. The maker of this compound is the Carbolide Chemical Company, of Monrovia, Md.

M. & M. Cement-Doh

This new preparation is made and sold by the M. & M. Manufacturing Company, of Akron, O. It is a rubber solution made by chemists for the purpose of filling out small bruises and cuts in the casing and thereby rejuvenating the rubber and lengthening its life.

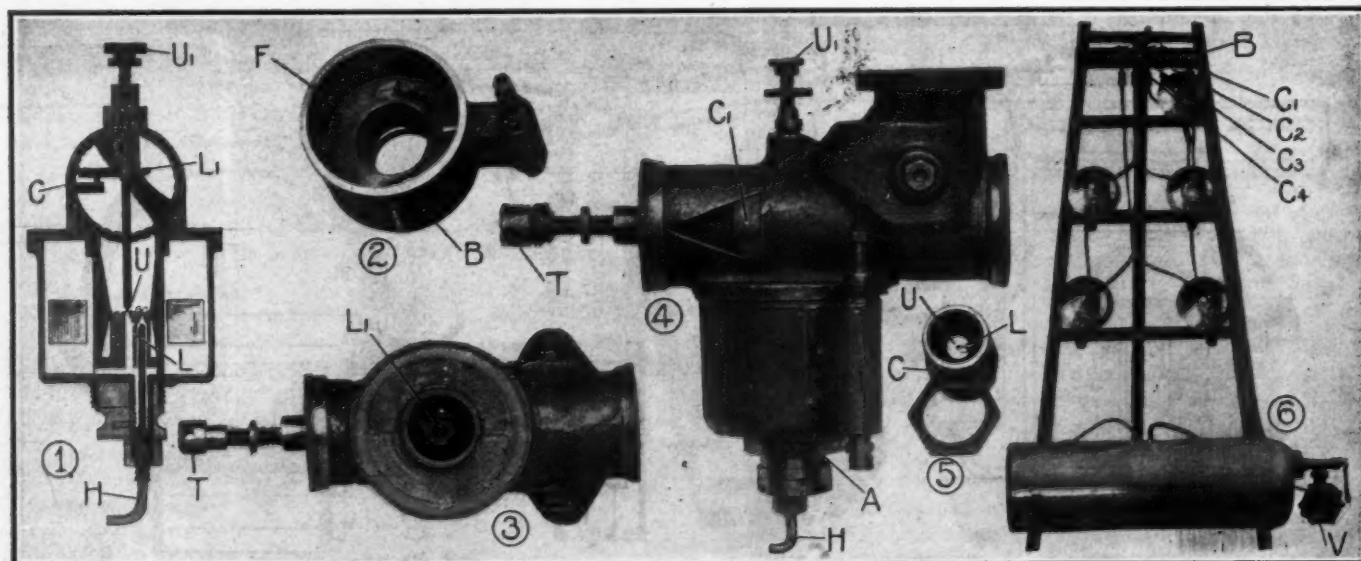


Fig. 1—Section through G. & T. float-chamber and needle mechanism. Fig. 2—Float-bowl and float. Fig. 3—Top view of auxiliary fuel-flow device. Fig. 4—View of G. & T. carbureter. Fig. 5—Casting containing needle valves. Fig. 6—Arrangement of units on Prest-O-Liter